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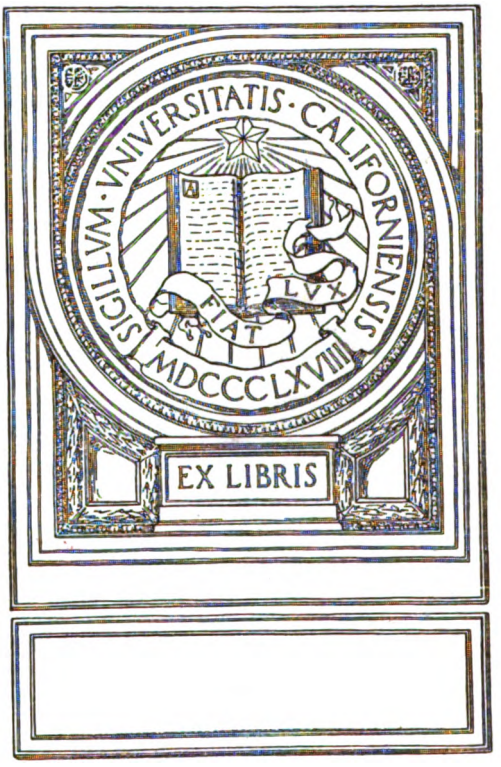

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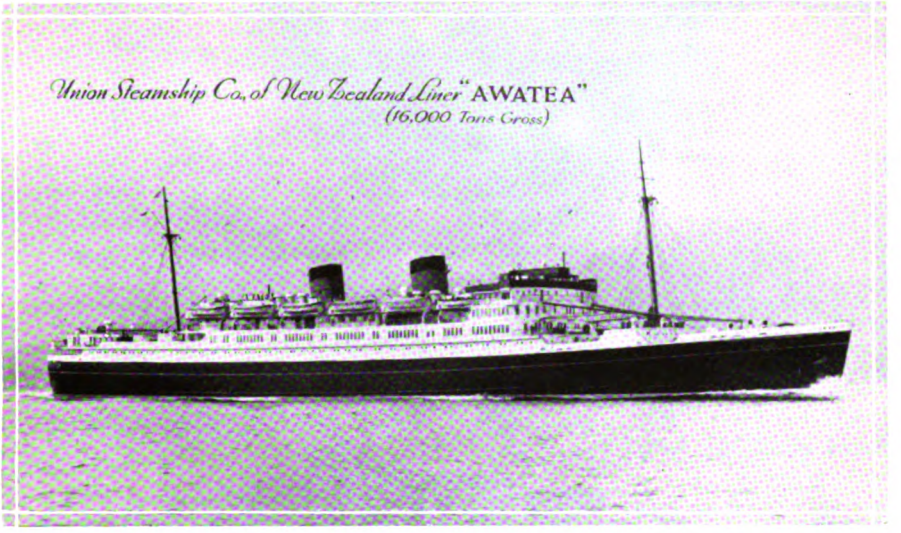

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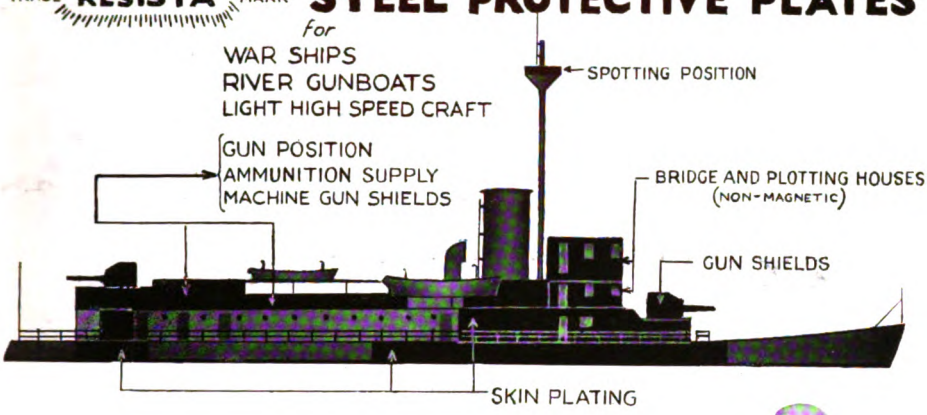

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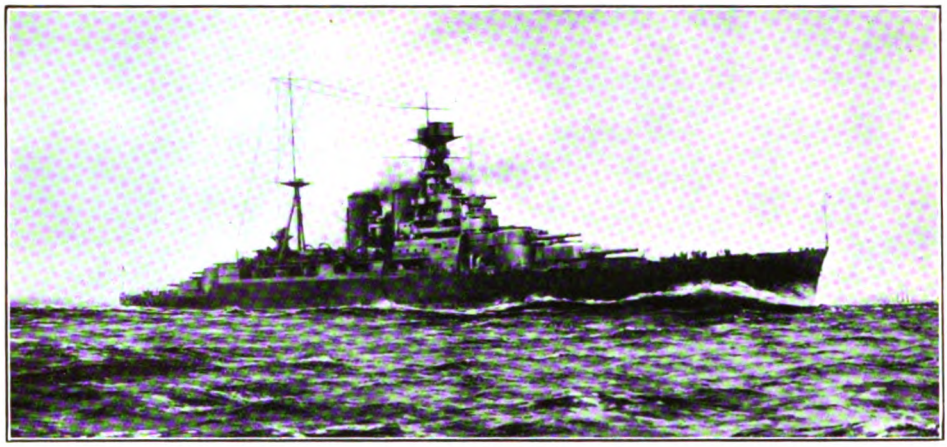

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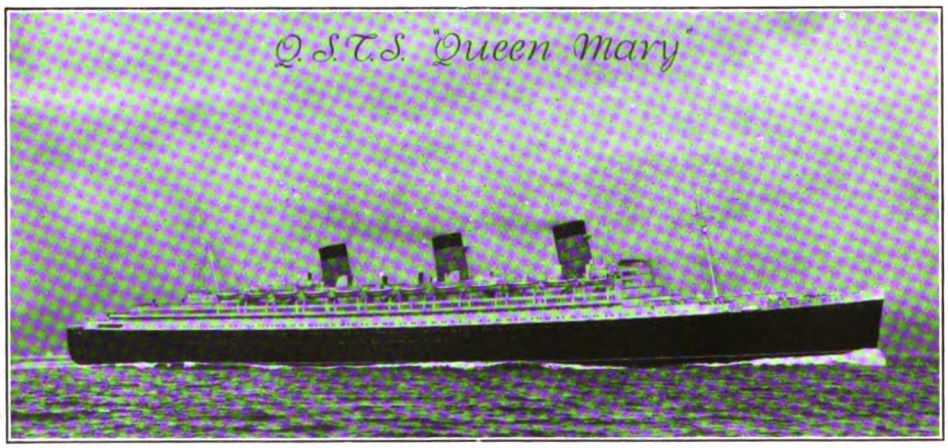

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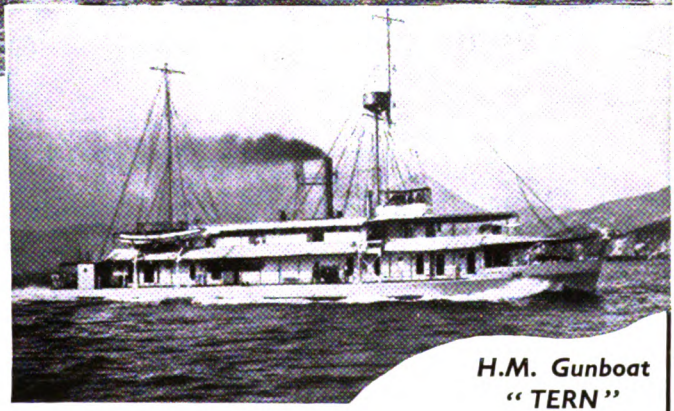

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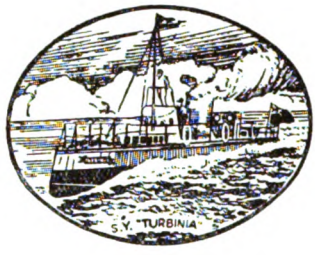
MARINE 

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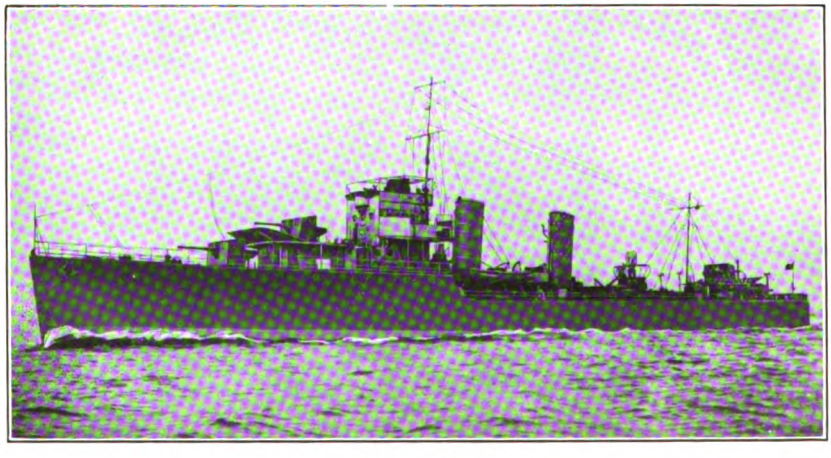

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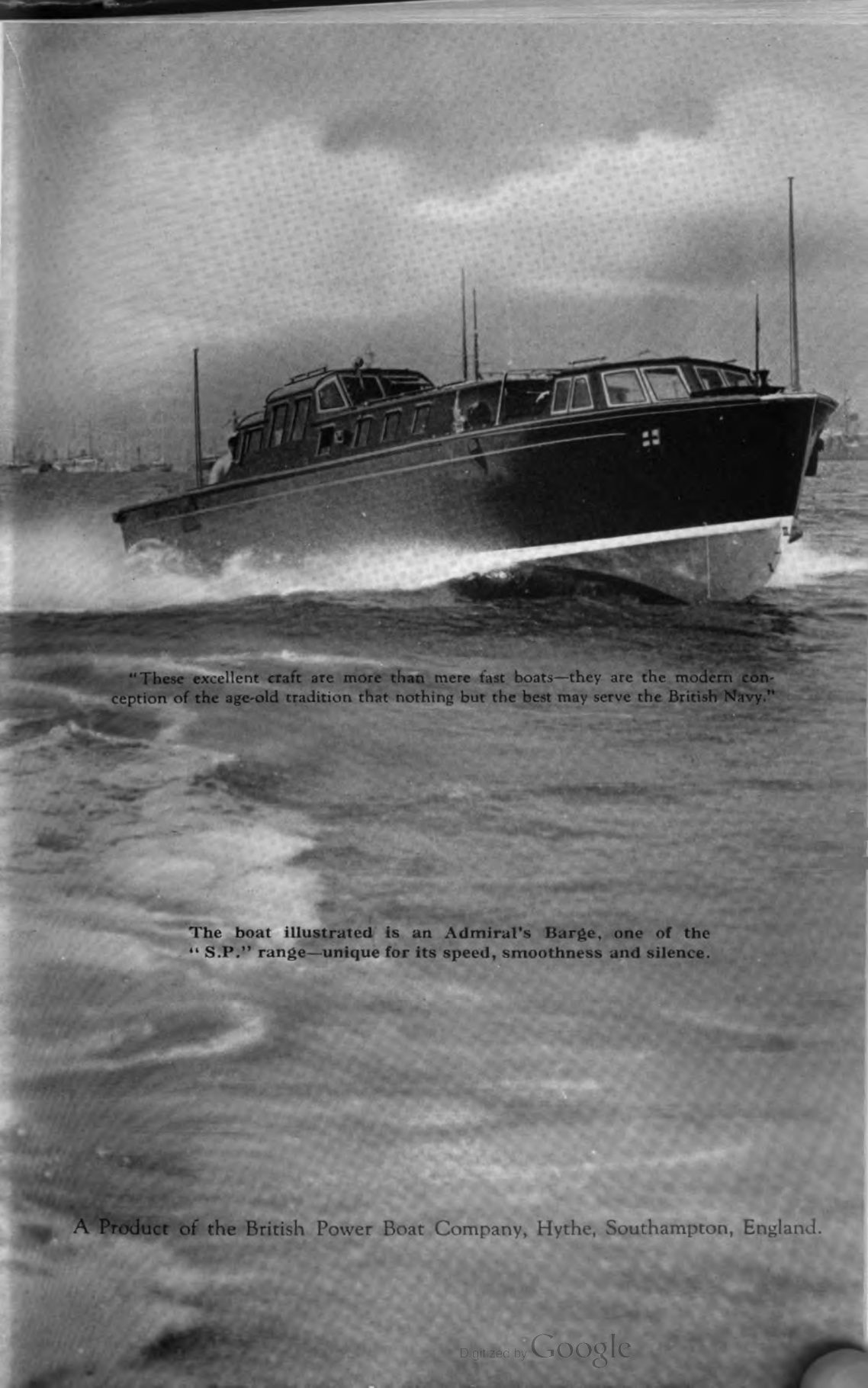

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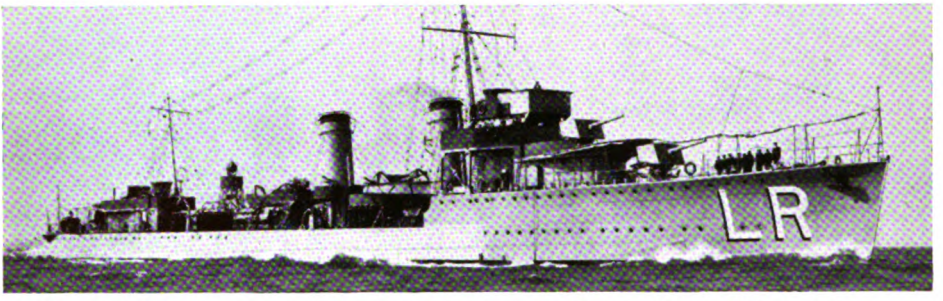

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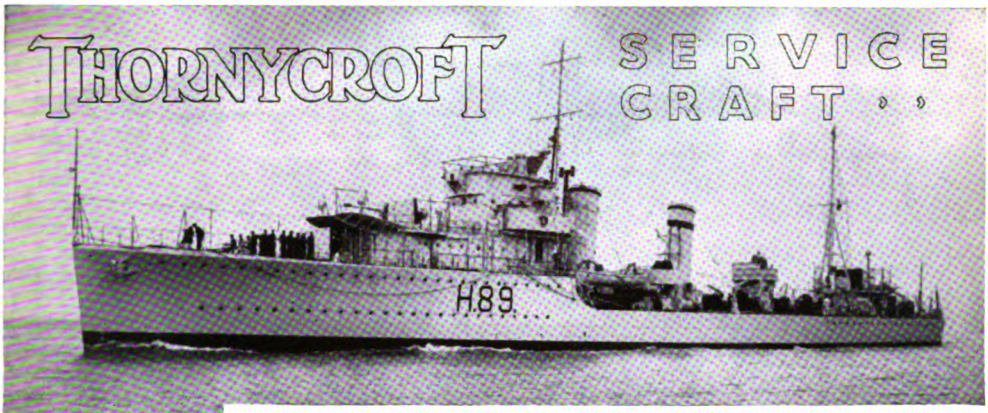

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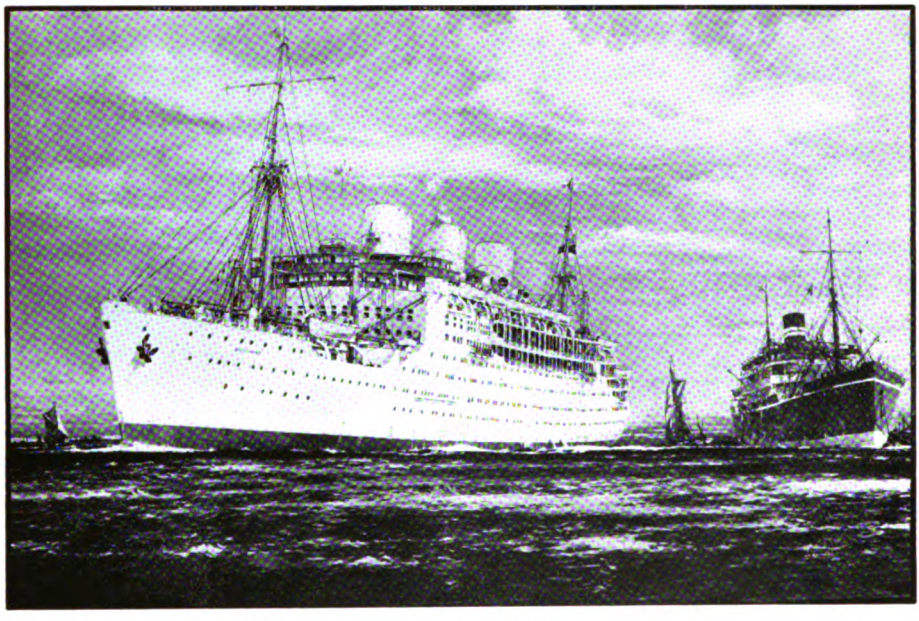

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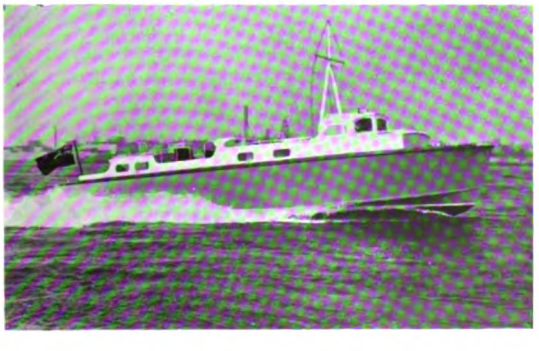

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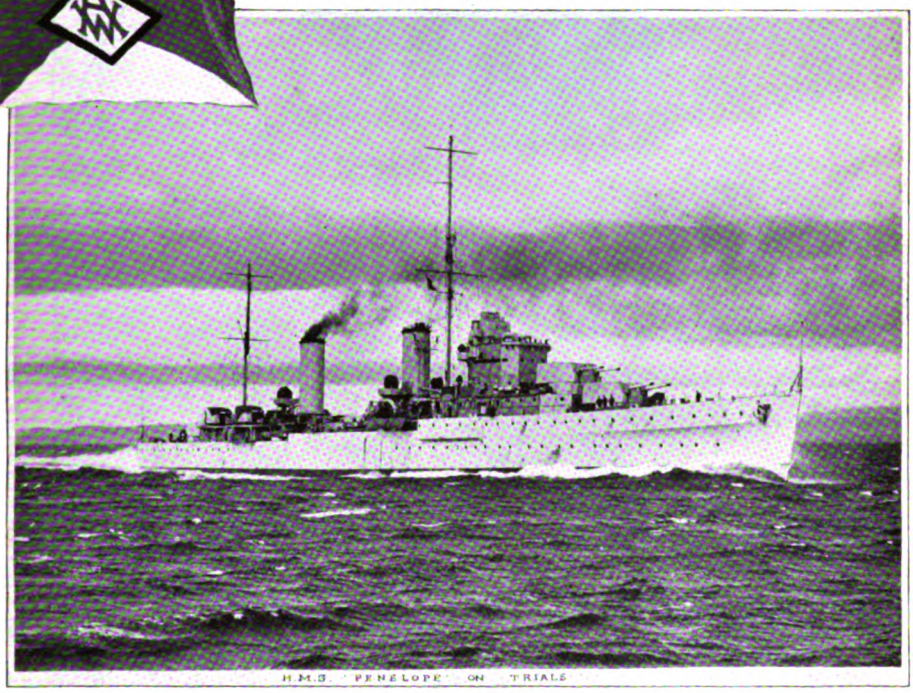

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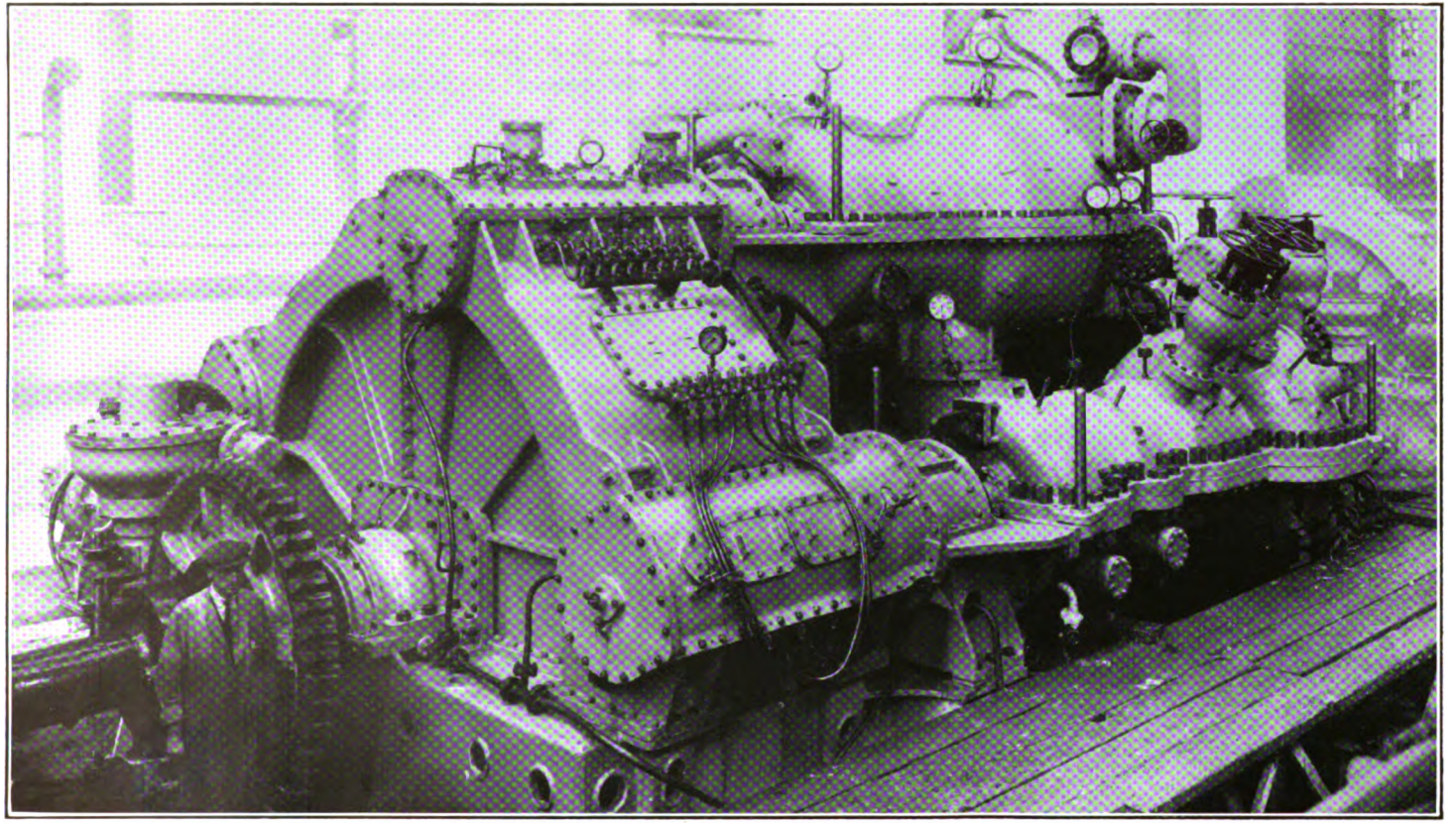

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PUBLISHERS' NOTE.

SINCE the publication of the 1936 Edition of "Brassey's Naval Annual," we have had to regret, together with many others, the death of Commander Robinson.

To us, as printers of "Brassey" since its birth and publishers since 1914, Commander Robinson was well known, and when he became Editor in 1929 we learnt to appreciate and value his many good qualities.

His loss is a great one to all who had at heart the interests of the Navy, and to us as publishers of the work with which he had been closely connected for so many years, perhaps a greater one. We therefore feel we should not like the 1937 Edition of "Brassey" to appear without some tribute from us to him and his work.

In his place we welcome Rear-Admiral H. G. Thursfield, whose connection with "Brassey" is of no recent date, though he himself has been a contributor to the last three numbers only. As Admiral Thursfield's father first became a regular contributor in the year 1890, we are happy in the knowledge that the new editor is one who is no stranger to the policy and tradition for which "Brassey's Naval Annual" has always stood.

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PREFACE.

"Brassey's Naval Annual" has suffered a heavy loss by the death of the late Editor, Commander C. N. Robinson, R.N.; so has his successor, who had enjoyed the privilege of his friendship for forty years. It is no easy task to follow in the footsteps of so competent and experienced an editor as Commander Robinson, and I can only beg the indulgence of my readers for shortcomings which will no doubt be obvious.

Following the precedent of 1936, "Brassey's Naval Annual" appears in April, as soon as possible after the publication of the Navy Estimates for the year. In order to make this possible, however, the greater part of the letter-press has to be in type soon after the New Year; and readers will realise that the body of the book covers the year 1936 only. As in last year's issue, an introductory chapter has been added dealing with the Navy Estimates and the Government's Defence plans for the year.

In the Naval Section, "Brassey" has again the advantage of the co-operation of most of its regular contributors. Captain Altham deals with the progress of foreign navies; Mr. G. H. Hurford contributes an analysis of comparative naval strengths; Captain Dewar continues his series of penetrating summaries of the play of international politics, out of which the naval policies of the Powers are born; and I have included a contribution of my own on the subject of Naval Treaties, the general lines of which were planned under Commander Robinson's tenure of the Editorship. Commander Robinson had also arranged with Korvettenkapitän Ruge—who has recently been promoted to the rank of Fregattenkapitän—for his very clear description of the German Navy of today. "Brassey" this year welcomes a new contributor in Commander H. Pursey, who writes on the evolution of the machinery for ascertaining and dealing with the grievances of the Lower Deck and with requests for the amelioration of their conditions of service. This subject is of importance to serving officers, and as few have any very intimate knowledge of how it has been handled in the past, Commander Pursey's summary should be of value. "J.B.S.," who prefers to remain anonymous, but whose qualifications for his task will be obvious to the reader, contributes a lucid summary of recent engineering progress in the Navy. Finally, Mr. E. H. Watts, himself a ship-owner and Vice-President of the Shipping Federation, in a brief but forceful chapter shows how great is the importance of the Merchant Navy in the scheme of Imperial Defence.

Turning to the Naval Air Section, I feel that an apology is due to readers. Much to my satisfaction, the contributor who prefers to be known only as "Volage" had again undertaken

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to contribute the opening chapter on "British Naval Air Progress," a task for which he is eminently qualified. Unfortunately, at the eleventh hour, circumstances which neither he nor I had foreseen, and over which we had no control, operated to prevent his giving me this year the benefit of his co-operation. There was then no time to seek a substitute who should possess "Volage's" qualifications, since most of the remainder of the book was already in the hands of the printer; I had thus no alternative but to act as substitute myself. I trust, however, that future issues will see this chapter, which is indeed the most important in this section, once more in hands more competent than my own. I have been fortunate in securing chapters on the French Naval Air Service from Captain Vincent-Brechignac, Director of the Naval Museum at the Louvre and the talented editor of "Flottes de Combat"; on "Empire Flying-Boat Routes" from Colonel Burchall, General Manager of Imperial Airways; and on the problem of an Atlantic Air Service from a contributor who prefers to remain anonymous. Purists may remark that the two latter deal with matters which are not connected with "Naval" air work. That is true, in the sense that the Navy has no direct connection with the evolution or control of civil aircraft using the seas; but neither has it with those of the Merchant Navy. Nevertheless the Navy is vitally interested in civil trans-oceanic services, whether they use the surface of the sea at all times or only occasionally; for they are subject in war to interruption by the naval forces of an enemy, and against that interruption it is the function of the Navy to protect them. A Naval Annual is thus interested in these services just as much as in the Merchant Navy. Finally, "Wings" contributes a "middle view" of the question of the Fleet Air Arm, into which it is satisfactory to note that the Government has at last commenced an enquiry. It is to be hoped that the bar to the cordial co-operation between the two Services which has existed so long in this controversy is now in the fair way to be removed.

By permission of the Director of Naval Construction, Mr. S. H. Watson has again undertaken the revision of the Tables of the Reference Section, with the Profiles and Plans of British and Foreign Warships. The information contained in these Tables is based on the latest figures which have appeared in the Press, and is believed to be accurate even where it has not yet been confirmed by official information. I am indebted to the Press Section, Air Ministry, for their courtesy in supplying me with various items of information, and in undertaking the revision of the Tables of British and Foreign Aircraft types. Finally, I am much indebted to Mr. G. H. Hurford for invaluable assistance in almost every branch of an editor's duties.

H. G. THURSFIELD.

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THE RESTORATION OF DEFENCE.

THE measures initiated a year ago for the restoration of the Defence Services to a strength commensurate with their responsibilities have been prosecuted vigorously. The activities of the Government in providing for the Defence Services during the last year have thus been merely a continuation of the policy adopted in 1936. There has been no change of policy to record, such as that announced in last year's White Paper, when the policy of setting an example to the world — which was universally ignored — of unilateral disarmament was abandoned in favour of that of rehabilitation of the Defence Services in order to " provide the necessary means both of safeguarding ourselves against aggression and of playing our part in the enforcement by common action of international obligations." It is for this reason, no doubt, that the White Paper of 1937 * is entitled a " Statement Relating to Defence Expenditure " instead of to " Defence " *tout court.* There is no new policy to be explained, but merely the new methods of financing the defence measures of this and following years, necessitated by their magnitude and unprecedented cost.

The White Paper, which was issued on February 16, opens with an explanation that, since it would be neither justifiable nor practicable to meet the whole cost of the extended defence provisions from revenue, the Government are taking powers to finance them by loan up to a maximum of £400 million during the next five years. This figure is neither fixed nor definite ; the borrowing powers, once granted, will be used only to the extent specifically authorised by Parliament each year in accordance with the normal procedure. Modern developments have added enormously to the complexity, and therefore cost, of instruments of war, whether on land, sea, or air. Moreover :—

> While the necessity for modern equipment and for protection against air attack is common to many nations, the wide dispersal of the territories comprised within the British Empire and the dependence of these islands upon supplies from overseas lay a special responsibility upon British Forces and, above all, upon the Navy to preserve the freedom of communication overseas, which is vital to our existence. The modernisation of the defences of strategic points in various parts of the Empire is, in itself, a formidable item in the cost of the Defence programme.

Taking the Services in order and starting with the Navy, it is pointed out that a heavy construction programme in the next few years is inevitable. Of our 15 capital ships, only three are of post-war construction. Consequently, two new ones, costing some £8 million apiece, were laid down on January 1, 1937—the earliest date permitted by our Treaty engagements—and three more were to be proposed in the coming Estimates. Seven cruisers were

* Cd. 5374—see page 337.

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included in the 1936 Estimates—increased to that figure in July from the five of the original programme—and there would be another seven in the 1937 programme; the two aircraft carriers of 1936 would also be repeated this year. There would also be heavy expenditure in modernising existing ships, both battleships and cruisers, by the provision of more powerful anti-aircraft defence; and in increased provision for ammunition, fuel, stores, and equipment, for dockyard facilities and for the Fleet Air Arm. As an example of the proportion in which costs have risen, the complete cost of the new ships laid down in 1936 will work out at £50 million as against the £12 million average of preceding years; while the figure for 1937, in which year three battleships will be laid down as against the two of 1936, will be even higher.

As regards Army expenditure, the greater part of the increase is due to mechanisation, a process which entails the provision also of additional storage, workshops, and buildings, comparable to the dockyards needed by the Fleet. But there would also be considerable expenditure on certain measures designed to make life in the Army more attractive, which will swell costs in two ways—by their own intrinsic cost and by the increase in Army numbers due to improved recruiting. Two of the four new infantry battalions projected in 1936 were to be raised in the near future, and also one new Army Tank battalion. Another new Army Tank battalion would be required in the near future, together with certain unspecified "ancillary troops." Steps were also to be taken to modernise the equipment of the Territorial Army.

Turning to the Air Force, it is repeated that the prime function of the Royal Air Force is to provide an effective deterrent to any attack on the vital interests of the country, either at home or abroad. The expansion programme calls for the preparation of large numbers of new aerodromes, and the building of over 75 operational, training, and other stations at home and abroad. The personnel has already risen from 31,000 in 1934 to over 50,000 in 1936, and there would be a further large increase in 1937. In the matter of costs, it must be realised that, even when the special costs of expansion are finished, upkeep will be much more expensive than in the past, not only on account of larger numbers, but because the technical development is rapid and each new type is costlier than the last.

The subject of "shadow factories" is then explained. The demands of the Services on industry in both the period of expansion and in war are much greater than can be satisfied by the normal resources of industry. The Government is therefore building a number of "shadow factories" both for aircraft and for munitions, located according to the demands not only of industry but also of defence. These factories are being operated by selected manufacturing firms during the period of expansion; when that is completed, they will be retained in a condition to be rapidly available for war purposes when needed, in order to avoid the dislocation of industry and the lag in war production which would ensue on the outbreak of war if reliance were placed wholly upon privately organised industry. Steps are also being taken to provide stocks of

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essential raw materials needed immediately in war, and for the multifarious measures included under the heading of anti-aircraft defence.

On the subject of the cost, it is explained that an accurate forecast is not practicable. The Defence Programme is to be spread over several years, during which international conditions change, while technical evolution and development continues. But there is, in the view of the Government, no justification for slowing down the process of rearmament from the pace set by their present measures. It would, therefore, " be imprudent to contemplate a total expenditure on defence during the next five years of much less than £1,500 millions. . . . It would be neither practicable nor just that the whole burden of making good these deficiencies in the short period of five years should be thrown upon the taxpayer during that time, and His Majesty's Government are satisfied that, in proposing to spread a part of it over a longer period, they are pursuing a course which is fully justified both in equity and in the general interests of the nation."

THIRD SUPPLEMENTARY ESTIMATE, 1936

With the 1937 Navy Estimates was issued a third Supplementary Estimate for the financial year 1936 for 1,000 extra men and for the sum of £100. The explanation of the extra numbers now asked for is that it is desired to take advantage of the favourable state of recruiting to enter additional numbers in the current financial year, thereby relieving the following year. The extra £100 asked for is merely a token sum, the voting of which provides an opportunity for explaining certain readjustments in former plans which the Admiralty desire to make. An increase from July, 1936, in the bonus paid to industrial employees costs an extra £230,000. The purchase and adaptation as a training establishment for boys and artificer apprentices of the S.S. Majestic—now H.M.S. Caledonia—cost £366,000. Various works services, in the dockyards, training establishments and experimental establishments, are to be accelerated to the extent of an extra £414,500. These increases are to be financed by appropriating the sum of £400,000, paid by the Canadian Government for the two destroyers Cygnet and Crescent transferred to them, and by savings of £380,400 in the amount it was earlier proposed to spend on ammunition.

Opportunity was also taken to announce the cancellation from the 1936 programme of one " J " class destroyer. This latter change was due to the decision that in future destroyer flotillas are to consist of eight identical boats, one of which is to be fitted with the communications and accommodation required by the Captain (D), instead of eight identical boats with one larger flotilla leader.

NAVY ESTIMATES, 1937

The 1937 Estimates were published on March 4. Their net total was £105,065,000, though, as explained in the First Lord's Explanatory Statement, since £27 millions is to be financed by loan, the net

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total appearing on the Estimates themselves was thus £78,065,000. This represents an increase over 1936 of £23¾ millions. The greater part of this increase is due to new construction, Vote 8 being up by over £14 millions. This is due not only to the current year's programme being larger than last year's, but also to the fact that heavier payments on ships begun under last year's programme fall due this year. The maintenance of the fleet, which includes provision for modernisation of older ships, is up by over £9 million, and additional aircraft for the Fleet Air Arm account for half a million of increase. Vote A is up by nearly 11,000 men.

The new construction programme* consists of—

3 battleships—" King George V " class, 14-inch guns,
2 aircraft carriers,
5 8,000-ton cruisers,
2 5,300-ton cruisers,
16 " J " class destroyers—*i.e.* two flotillas,
7 submarines,

and a number of smaller craft, including 10 more Motor Torpedo Boats, together with two depot ships. The programme is practically equivalent to that of 1936, except that it includes one more battleship. The First Lord's Statement concludes with a mention of the expiration of the Washington and 1930 London Naval Treaties on December 31, 1936, but states that, pending ratification of the 1936 London Naval Treaty, the qualitative limits prescribed by it are being observed.

Attached to the First Lord's Statement is the usual review of naval developments and the activities of the Fleet during the last year, most of which are dealt with elsewhere in this volume. In addition to these, it was mentioned that the Valiant has returned home from the Mediterranean and will shortly be taken in hand for large repairs, which will include the supply of new engines and boilers. The large repairs of the Warspite are nearly completed, and when they are, she will take the place of the Queen Elizabeth in the Mediterranean, which will then be taken in hand for the same purpose.

The new cruisers Southampton, Newcastle, Sheffield, Glasgow and Birmingham of the 1933 and 1934 programmes should all join the 2nd Cruiser Squadron during 1937, replacing the Leander, transferred to New Zealand, the Orion, which would be transferred to the American Station in place of the Dragon, and the Neptune, which would relieve the Carlisle on the African Station. The Aurora, on completion in August, would take the Broad Pendant of the Commodore, Home Fleet Flotillas.

The activities of ships on foreign Stations are reviewed as usual. Anti-slavery patrols have been regularly carried out in the Persian Gulf and Red Sea, anti-piracy patrols in the China Seas, and humanitarian work in various places, such as, for instance, searches for the missing Imperial Airways Liner Horsa in the Persian Gulf, and for a party missing from the Royal Research Ship Discovery in the South Shetlands, on the verge of the Antarctic.

* See page 346.

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On the subject of Personnel, the formation of the new Royal Naval Volunteer Supplementary Reserve is mentioned. This consists of yachtsmen and others with sea experience who cannot, or are unwilling to, spare the time for regular drills and training, but wish to be earmarked for the Sea Service in the event of war. Recruiting for this branch has been good. The present shortage of officers of the rank of lieutenant, due to the rapid expansion of the Fleet, is mentioned, together with the measures adopted to make it good. In addition to those mentioned in Chapter I, there is the revival of the "Supplementary List" of lieutenants, filled by transfers from the Royal Naval Reserve. Officers on this list are not eligible for promotion to the rank of commander, unless for exceptional services, and retire at the age of 45 on a pension slightly less than that of regular officers. The Statement does not mention the somewhat unfavourable reception given to this scheme, in Parliament and the Press, on its introduction on February 2. It was announced that it was intended to introduce the "house" system at the Royal Naval College, Darmouth, in order to do away with the rigid segregation by terms which has hitherto ruled there.

The progress of new construction and of large repairs to older ships is reviewed at length. Reference is made to the grants to contractors for extension of factories and plant mentioned for the first time in the 2nd Supplementary Estimate of 1936;* and it is mentioned that this scheme is being developed on a substantial scale under votes 8, 9 and 10. Under the heading of Naval Works various items are mentioned, including extensions to the cordite factory at Holton Heath, a new magazine depot, a new Signal School at Portsmouth, and a new hospital at Hong Kong. "Work on the Singapore Naval Base proceeds satisfactorily and certain additional work is being carried out to increase the accommodation for capital ships by about 50 per cent." This additional work was later described in the House of Commons as being a re-adoption of certain items originally included in the scheme, but cut out when the "truncated scheme" was substituted in 1924.

The appointment in May, 1936, of the Contracts Advisory Committee under the chairmanship of Sir Malcolm Robertson is mentioned, and the valuable advice that has been received from that Committee. Under the heading of Engineering it is stated that a new type of submarine engine has been evolved which promises well; and that the progress of oxy-hydrogen engines at home and abroad is being watched closely. Steady progress has been made with the application of electric welding to ship construction.

In the Estimates themselves† direct comparison with previous years is a little difficult, owing to the fact that the £27 million which is to be provided from loans is split up into various "Appropriations in Aid," and is thus deducted from the gross totals of various votes to arrive at a technical "net total." In order to reach a true comparison in the tables reproduced on pages 359 and 360 of this

* See page 326.
† See pages 359 and 360.

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book, the following sums should be added to the figures given for 1937: Vote 8, II, £2 million; Vote 8, III, £17 million; Vote 9, £5 million; Vote 10, £3 million.

The assistance to contractors for extension of factories and provision of new plant is to be found under new Sub-headings: Vote 8, III. DD, Vote 9, FF, and Vote 10, F; it amounts in all to some £3¾ million.

Further increases are proposed at Singapore which, as mentioned above, were explained in the House of Commons as being due to the restoration of the original scheme for the base. The "truncated scheme" provided for a total expenditure under Vote 10 (Works) of £7,700,000 (as given in the 1936 Estimates). This sum is, of course, exclusive of any amounts provided for machinery or furniture (under Vote 8), or for defences, which fall on Army and Air Force votes. The 1st Supplementary Estimate of 1936 increased the "Works" total to £9,200,000; it is now further increased to £9,735,000 by the 1937 Estimates, of which £640,000 is to be spent this year, leaving £3,269,200 to complete in future years. The amount taken for machinery under Vote 8 is also increased by nearly a quarter of a million.

The process of acceleration of the new programme by the more prompt laying down of new ships after they are authorised by Parliament is again evident. Just over half-a-million is to be spent on each of the three new battleships, in the current year, as against little more than half that sum last year on the King George V and Prince of Wales. That comparison is perhaps not quite fair, since the King George V and Prince of Wales could not, owing to Treaty engagements, be laid down before January 1. But a quarter-million is to be spent on each of the 8,000-ton cruisers of the new programme in the year of their laying down, as against under half that sum on the Belfast and Edinburgh of the 1936 programme. Apart from these points, the Estimates present no novel features.

It only remains to record that on March 11, 1937, the Minister for the Co-ordination of Defence made the following statement in the House of Commons in answer to a question:—

> As a result of my consideration of this question (the Fleet Air Arm), I have decided, with the aid of the Chiefs of Staff Sub-Committee and the other responsible authorities concerned, to conduct a systematic investigation of the important factors involved in this matter, including the allied wider considerations. My investigations have already begun.

It is satisfactory to note that this matter is at last to be definitely investigated by a competent authority. It has been stated more than once by irresponsible persons both in Parliament and in the Press that it has been "often enquired into and often settled" in the past, but the statements are unfounded. There has been no enquiry into the matter for over ten years, and during that time every effort has been made to work the present organisation. The fact that, despite these efforts, there is still serious dissatisfaction with the present régime is clear evidence that enquiry into the subject is already overdue.

H. G. T.

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NAVAL SECTION

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HIGH SPEED SHIP'S BOAT.

A New Type 25-ft. Admiral's Barge supplied to H.M. Yacht "Victoria and Albert,' 1936.

(By courtesy of the builders, Messrs. Vosper, Ltd., Portsmouth.)

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CHAPTER I.

Naval Events of 1936.

Though the death of His late Majesty King George V occurred in the year covered by the present survey, the part taken by the Navy in the Royal funeral, and the accession message to the Navy of His Majesty King Edward VIII, were described in the preceding number and the description will not be repeated here.

His Majesty King Edward VIII paid the first visit of his reign to the Navy when he went to Portsmouth on June 30 and July 1. On the first day he arrived at the Naval Barracks in the morning by car, where he was received by the Commodore and officers. From there he went to the Vernon and embarked in H.M. Motor Torpedo Boat No. 1, recently delivered and commissioned for the first time, in which he made a trip to Spithead ; there she carried out a torpedo attack, scoring a hit under the target destroyer. From M.T.B. No. I he disembarked at Whale Island—it illustrates the qualities of the new craft to mention that the whole trip occupied only 45 minutes—where he inspected detachments from the Reserve Fleet and the Boys' Training Establishment, H.M.S. St. Vincent, as well as the personnel of the Gunnery School. His last inspection of the morning was of the Royal Marines at Eastney, after which he lunched with the Commander-in-Chief, Admiral Sir John Kelly, at Admiralty House, and spent the afternoon on board the Royal Yacht Victoria and Albert before leaving Portsmouth again by road. On the following day he again visited Portsmouth, paying a surprise visit to the Middlesex Regiment before lunching on board the Victoria and Albert, and later returning to London by road. His Majesty inspected the personnel of each establishment that he visited, expressed himself exceedingly well pleased with all that he had seen, and ordered the main brace to be spliced.

On November 12 and 13 His Majesty visited the Home Fleet at Portland, attended by the First Lord and First Sea Lord of the Admiralty, Sir Samuel Hoare and Admiral of the Fleet Sir Ernle Chatfield, staying during his visit on board the Victoria and Albert. The Royal train was due at Portland station at 4 a.m., but owing to the unusual combination of a heavy westerly gale with a high spring tide, the Isle of Portland was cut off from the main land by flooding, and it was only with difficulty that the King was able to start his programme to time. He adhered to it, however, and despite gale and rain visited, during the two days, practically every ship in the fleet as well as the Naval Establishments at Portland. On the evening of the first day, after entertaining the captains and flag officers of the fleet at dinner on board the Victoria and Albert,

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he was present, accompanied only by his personal staff and officers in attendance, at a concert given on board the Courageous for the ships' companies of the fleet. Afterwards he attended an officers' "At Home" on board the Nelson, flagship of Admiral Sir Roger Backhouse. The following day he completed his inspection of ships and establishments before returning to Windsor by train from Weymouth. His Majesty again expressed himself well pleased with all that he had seen, and ordered the main brace to be spliced as he left the fleet. The following signals were exchanged on his departure:—

From the King.

I wish to express to Flag and Commanding officers my satisfaction with all that I have seen. The appearance of ships and men was admirable and I congratulate you all.

Reply from Sir Roger Backhouse.

The Commander-in-Chief Home Fleet presents his humble duty and begs to thank His Majesty for his gracious message, which is most highly valued by all officers and men who have been greatly privileged by his inspection.

This inspection was almost the last public act of His Majesty's reign, but not the Navy's last contact with him. After his abdication, H.M.S. Fury conveyed His Royal Highness the Duke of Windsor from Portsmouth to Boulogne on the first stage of his journey to Austria.

On December 14, his birthday, His Majesty King George VI addressed messages to the Fighting Services on his accession. The message to the Navy ran as follows :—

On my accession to the throne I recall with pride that, as my dear Father did before me, I received my early training in the Royal Navy.

It has been my privilege to serve as a Naval Officer both in peace and in war; at Jutland, I saw for myself in action the maintenance of those great traditions which are the inheritance of British seamen.

It is my intention always to keep the closest touch with all ranks and ratings of the Naval Forces throughout the Empire, and with all matters affecting them. I shall do so in the sure knowledge that they will be worthy of the implicit trust placed in them by their fellow-countrymen, and that, in their hands, the honour of the British Navies will be upheld.

GEORGE, R.I.

On December 18, His Majesty was pleased to assume the rank of Admiral of the Fleet in the Navy, and the Colonelcy-in-Chief of the Royal Marines.

THE NAVAL TREATY.

Although the Naval Conference, which assembled in London in December, 1935, concluded the London Naval Treaty of 1936 in time for the text of that instrument to be printed in the last issue of "Brassey," it was not possible to include any account of the Conference in that volume. The treaty in its final state was a Three-Power agreement, signed only by the representatives of the United States, France, and the nations of the British Common-

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wealth. The Japanese representatives had withdrawn from the Conference in January, on the definite rejection of their plan for a "common upper limit" of naval tonnage; and the Italian representative withheld signature on political grounds, though the possibility of its being added later was not excluded. That addition has not yet been made at the time of writing, though one of the more important provisions of the treaty was accepted conditionally on January 15, 1937.

The treaty provides for "qualitative" limitation of the displacement of ships of various categories and of the calibre of the guns with which they may be armed, and for exchange of information between the signatories regarding intended building programmes. Since its signature, the British Government has held conversations with various other Powers separately, Germany, Russia, Poland, Denmark and Turkey, with a view to the conclusion of bilateral agreements having the same effect as the main treaty. The prospect of ratification of the latter must depend to a great extent upon the success or failure of these efforts to extend its scope to all important naval Powers. This subject is treated in greater detail in Chapter V.

FLEET MOVEMENTS.

At the beginning of the year the greater part of the Fleet was still concentrated in the Mediterranean. The Mediterranean Fleet proper was in the Eastern Mediterranean, using Alexandria and Haifa as its bases, which had been equipped with extempore defences; at Gibraltar or in its vicinity was a large part of the Home Fleet, and each fleet was reinforced by units detached from foreign stations and from the Dominion Navies. The Abyssinian war may be considered to have come to an end on May 5 with the Italian occupation of Addis Ababa, but it was not until sanctions were raised on July 15 that the tension in the Mediterranean relaxed sufficiently for the British naval concentration to be broken up. In the course of that month the Home Fleet returned from Gibraltar to Home Waters, and the new Australian cruiser Sydney, which had been attached to the Second Cruiser Squadron, soon afterwards joined the Royal Australian Navy. From Alexandria the cruiser Berwick, the minelayer Adventure, four destroyers and four submarines returned to the China Station; the cruisers Exeter and Ajax left for the South American Station; the cruiser Achilles joined the New Zealand Division, for which for some time she had been destined; and the cruiser Australia, of the Australian Navy, returned to her home station. The old cruisers Coventry and Curlew, which had been specially rearmed as anti-aircraft battery ships and had joined the fleet at Alexandria, returned home and were paid off; while the destroyer flotillas, which had been largely augmented during the emergency, were gradually reorganised and reduced to the normal three flotillas with each main fleet, composed of the newest destroyers that had been delivered, the 1st, 2nd and 3rd with the Mediterranean Fleet, the 4th, 5th and 6th with the Home Fleet. Two special appointments for flag officers which had been constituted during the

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state of emergency, those of 2nd in Command, 1st Cruiser Squadron, and Rear-Admiral of the Alexandria Base, lapsed during August.

At the end of the Abyssinian war, the Navy rendered one of its traditional services to ex-monarchs who are in need of them. The Emperor Haile Selassie was conveyed from Djibuti on May 4 by H.M.S. Enterprise, and landed at Haifa, whence he went to Jerusalem. The Government of Palestine, however, possibly feeling rather closer than was comfortable to the scene of hostilities, and, moreover, preoccupied with their own difficulties, no doubt found him an uncomfortable guest; and on May 23 he left Haifa again, on board H.M.S. Capetown, on his journey to England.

Palestine.

In April, while the Abyssinian war was still in full blast, disturbances occurred in Palestine as the result of Arab disquiet at the magnitude of Jewish immigration, to cope with which strong reinforcements of the military garrison were eventually necessary. Several of H.M. Ships, however, were as usual first on the scene, and were able to contribute detachments immediately assistance was needed, pending the arrival of military units. Two armoured trains were improvised by the ships at Haifa, and worked for many months by naval crews, doing invaluable work in patrolling. The continuance of the disturbances kept many ships in the somewhat arid Palestinian ports for months together.

Spain.

While these conditions in the Levant still obtained, and before the Ethiopian emergency had fully subsided, yet another Mediterranean emergency arose which called for the services of H.M. Ships, this time at the other end of the Mediterranean. In July the situation in the Spanish civil war became so menacing that H.M. Ships were despatched to all the ports in Spain, to remove any British subjects who wished to leave, and to protect British interests generally. In this work they were kept busy for the remainder of the year. Over 6,000 refugees, of over fifty nationalities besides British, were evacuated from Barcelona alone by H.M. Ships, the work there being organised by Vice-Admiral M. K. Horton, commanding the First Cruiser Squadron. As many more were evacuated from other ports. On several occasions British men-of-war intervened to prevent interference, outside territorial waters, with British merchant vessels by Spanish men-of-war; and British naval officers took every opportunity of mediating between the warring factions with a view to exchange of hostages and prisoners, particularly in the ports on the north coast of Spain. This latter work was still in progress at the end of the year.

Germany.

H.M.S. Neptune, Captain D. M. T. Bedford, paid a visit to Kiel from August 3 to 19, in response to an invitation from the German Government for a British man-of-war to be present during the

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Olympic Regattas, Kiel Week and the International Naval Sailing Races. The opportunity of this visit was taken to return to the German Navy on August 17 the ship's bell of the Hindenburg, recently salved from Scapa Flow. The bell was received by the Commander-in-Chief of the German Navy, General-Admiral Raeder, and it is to be hung in the Deutschland until there is another Hindenburg. Two retired Rear-Admirals were present at the function, who, as captains, had commanded the Hindenburg during the war.

The British team in the International Naval Sailing races consisted of Commander H. Denham as coxswain and Lieutenant Commander R. White as second hand, with Captain J. W. S. Dorling as representative on the sailing committee of the Royal Naval Sailing Association.

Disposition of Ships.

After the disorganisation caused by the Mediterranean concentration, the allocation of capital ships between the Mediterranean and Home Fleets, decided and announced two years ago, gradually came into force. The Battle Cruiser Squadron was transferred to the Mediterranean, H.M.S. Hood leaving Portsmouth on October 10, after refit and recommissioning, to become later on the flagship of Vice-Admiral G. Blake, Second-in-Command of the Mediterranean Fleet. The Repulse had joined the Mediterranean Fleet in June on completion of large repairs, and the Renown was then taken in hand. Of battleships, those of the "Queen Elizabeth" class not under large repair are now in the Mediterranean, and those of the "Royal Sovereign" class in the Home Fleet.

It was announced in November that the Second Minesweeping Flotilla, consisting of the Abingdon, Huntly, Fareham, Aberdare, Harrow, Widnes, Stoke, Derby and Bagshot, hitherto in reserve at Malta, but commissioned for service during the emergency, would be transferred to the China Station. They left Malta for Hong Kong on January 25.

H.M.S. Enterprise left Portsmouth in February, 1936, after large repair, to return to the East Indies Station, relieving the Colombo.

H.M.S. Amphion on completion joined the African Station, and hoisted the flag of the Commander-in-Chief on October 21.

EXERCISES.

Owing to the emergency in the Mediterranean the usual Combined Fleet Exercises did not take place. There were, however, several inter-Service exercises during the year.

In August a landing exercise was carried out on the Hampshire coast. The invading military force, consisting of the 3rd Division, Major-General Heywood, embarked in transports at Plymouth on August 25. It was escorted by the Iron Duke, Curacoa, four destroyers and one monitor, but the scheme provided that no opposition was to be expected at sea. It was intended originally to make the landing at Milford, Hants, but owing to fog making it

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impossible to reach there safely, the naval commander decided, with the concurrence of the General, to land instead at Studland. The landing, which started at 6 a.m., was unopposed at first, and the whole of the "first flight" was ashore by 6.30. Soon afterwards, however, a fresh breeze from the east sprang up which made further landing on the exposed and shelving beach impossible. No horses at all could be got ashore, and up to noon only two cars and one lorry had been landed, at a pier built by the Royal Engineers.

Deprived of their transport, the troops ashore could make little progress towards their original objectives, and it was therefore decided to re-embark them by night. On their arrival back at Studland beach, however, it was found that re-embarkation there was still impossible. The Brigadier therefore decided to march round to Swanage, where it appeared possible that embarkation might be achieved. The troops incurred casualties during the march, and on the arrival of the survivors at Studland, it was found that embarkation was still impossible. They held on for a further twenty-four hours in the hope of improvement, which proved to be vain. The exercise period being then at an end, the troops returned home by train. The exercise afforded a valuable demonstration of the dependence of Combined Operations on the favour of the weather for their success.

In October, a similar exercise was carried out at Singapore. Details of the Middlesex Regiment and the Royal Inniskilling Fusiliers were embarked in the sloops Grimsby and Folkestone and landed east and west of Keppel Harbour. The defending troops were the Singapore Volunteer Corps and the regular Royal Artillery manning the Blakang Mati Defences. Detachments of the Royal Air Force and of the Straits Settlements R.N.V.R. also took part.

A minor exercise of the same sort was carried out in Scotland in July. During his cruise of inspection in H.M.S. Effingham the Vice-Admiral Commanding the Reserve Fleet embarked a party of R.N.R. Cadets from the Conway for a short cruise. Off Oban, a number of them armed with rifles and blank ammunition were landed on the barren island of Kerrera, to represent a party of unruly Arabs, who were duly hunted by a platoon of Marines landed from the Effingham for that purpose.

VISITS OF FOREIGN MEN-OF-WAR.

The United States Naval Academy Practice Squadron, comprising the battleships Arkansas, Oklahoma and Wyoming, arrived at Portsmouth on June 19 for a stay of nine days. The visit was considered to be private and there was thus no civic reception, but the midshipmen under training were shown round all the schools and training establishments of the port. They also went to London, where fifty of them paid a visit to the House of Commons. Rear-Admiral Wilson Brown, commanding the Practice Squadron, was received by Sir Samuel Hoare, the First Lord of the Admiralty. The cruiser Quincy visited Edinburgh from August 28 to September 7.

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THE UNITED STATES FLOTILLA LEADER PORTER.

Commissioned for Service, 1936.

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The French "contre-torpilleurs" Chacal and Leopard visited Portsmouth from August 26 to August 29.

The Brazilian training ship for midshipmen, the Almirante Saldanha, paid a visit to Chatham of a few days towards the end of June. The Polish training ship for cadets, Iskra, visited Gravesend in September, and several of the cadets paid visits to London.

A Turkish squadron, commanded by Vice-Admiral Sukur Okan, consisting of the battle cruiser Yavouz Sultan Selim (ex-Goeben), the destroyers Zafer, Tinaztepe, Adatepe and Kocatepe, the submarine depot ship Erkin, and the submarines Dumlupinar, Gür, Sakarya, Ikindji and Birindji, visited Malta for a week in November.

MISCELLANEOUS INCIDENTS.

On August 28 the Greek steamship Antonia G. Lemos was in collision in a fog with H.M.S. Keith twenty miles north of Alderney. The Lemos sank, but there were no casualties, the whole of her company being saved by the Keith, assisted by the Beagle of the same Flotilla.

On October 7, when H.M.S. Medway and some of the China Station submarines were at Keelung in Formosa, three seamen of the Medway who were on shore became involved in a dispute over a taxi fare. It was afterwards established that the fare in dispute had actually been paid, but the seamen were compelled to go to the Japanese police station, and while detained there they were seriously maltreated, one of them having his jaw broken. An officer of the Medway who went to the police station to secure their release was insulted. The British Government took a serious view of this incident, and the Commander-in-Chief of the station, Vice-Admiral Sir Charles Little, cancelled his projected visit of ceremony to Tokio pending receipt of an apology, compensation for the men affected, and punishment of the Japanese official responsible. Up to the end of the year, no satisfactory communication had been received from the Japanese Government.

The Treaty of Alliance between Great Britain and Egypt was signed in August. Amongst its provisions was an undertaking by the Egyptian Government to place its ports at the disposal of the British Navy whenever the latter should be involved in war.

BOARD OF ADMIRALTY.

On June 6 Sir Samuel Hoare succeeded Viscount Monsell as First Lord, a post which he had held for five years. Another change on the Board occurred very shortly afterwards, when Sir Oswyn Murray, Permanent Secretary since 1916, died in office on July 11. He was succeeded on July 23 by Sir Archibald Carter, K.C.I.E., C.B., from the India Office, where he had just been advanced to the position of Assistant Under-Secretary of State. This appointment was a departure from precedent, for it is many years since a Permanent Secretary of the Admiralty has been selected from outside the

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Admiralty Office itself. On October 2 Rear-Admiral J. H. D. Cunningham, M.V.O., succeeded Rear-Admiral C. E. Kennedy-Purvis as Assistant Chief of the Naval Staff.

OTHER CHANGES AT THE ADMIRALTY.

On September 12 the Engineer-in-Chief of the Navy, Engineer Vice-Admiral Sir Harold Brown, K.C.B., was appointed an additional Member of the Army Council with the title of Director-General of Munitions Production. He was succeeded as Engineer-in-Chief by Engineer Rear-Admiral G. Preece, C.B., who was promoted to Engineer Vice-Admiral.

On October 2 Major-General W. W. Godfrey succeeded Lieutenant-General Sir Richard Foster as Adjutant-General, Royal Marines.

On July 25 Sir Arthur W. Johns, K.C.B., C.B.E., retired from the position of Director of Naval Construction on account of ill health, and was succeeded by Mr. S. V. Goodall, O.B.E. Sir Arthur died on January 13, 1937.

On October 18 the post of Adviser on Education was abolished on the retirement, on reaching the age limit, of Mr. A. P. McMullen, who had held it since 1919. It was replaced by the position of Director of the Education Department, to which Instructor Captain A. E. Hall, C.B.E., was appointed.

CHANGES IN FLAG COMMANDS.

On January 11 Vice-Admiral Sir Charles Little succeeded Admiral Sir Frederick Dreyer as Commander-in-Chief in China.

On February 14 Vice-Admiral H. J. S. Brownrigg succeeded Admiral Sir George Chetwode as Admiral Commanding Naval Reserves.

On March 4 Vice-Admiral N. F. Laurence succeeded Vice-Admiral Sir Alexander Ramsay in command of the Aircraft Carriers, while the latter, on June 14, succeeded Vice-Admiral Sir Frank Rose, who had to give up his command on account of ill health, as Commander-in-Chief, East Indies.

On March 20 Admiral Sir Dudley Pound at last succeeded Admiral Sir William Fisher, under whom he had been serving as Chief of Staff for some months, as Commander-in-Chief, Mediterranean, and the latter on return home relieved Admiral of the Fleet Sir John Kelly on July 13 as Commander-in-Chief, Portsmouth.

On April 9 Rear-Admiral J. F. Somerville succeeded Rear-Admiral A. B. Cunningham in the command of the Destroyer Flotillas of the Mediterranean Fleet. On August 12 Vice-Admiral G. Blake succeeded Vice-Admiral Sir Charles Forbes as Second in Command, Mediterranean, with which appointment is now combined the command of the Battle Cruiser Squadron.

In October Rear-Admiral C. E. Kennedy-Purvis succeeded Vice-Admiral Max Horton in command of the First Cruiser Squadron,

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Mediterranean, and on December 14 Rear-Admiral T. F. P. Calvert relieved Vice-Admiral S. J. Meyrick in the command of the Second Cruiser Squadron, Home Fleet.

OBITUARY.

Admiral of the Fleet Earl Beatty died on March 11. He had caught a chill attending the funeral of his old chief, Earl Jellicoe, some months earlier, and had never really recovered from it. He was buried in the crypt of St. Paul's Cathedral, close to Nelson and Jellicoe, the funeral service being conducted by the Archbishop of Canterbury.

Admiral of the Fleet Sir John Kelly died in London on November 5. He had been specially promoted to that rank, "in accordance with His Majesty's wishes," on his relief from the Portsmouth command, the day before he was due to retire on reaching the age limit. He was buried at sea.

THE JELLICOE MEMORIAL.

A public appeal for funds for a memorial to the late Earl Jellicoe was launched at a meeting at the Mansion House on May 22, 1936, supported by H.R.H. the Duke of York, now His Majesty King George VI. In accordance with Lady Jellicoe's expressed wish that the greater part of the memorial should be devoted to the welfare of youth, it was decided that the funds subscribed should be devoted to the provision of a new "Jellicoe House" at the Greenwich Royal Hospital School, now at Holbrook in Suffolk. There are at present ten houses, and the new house would accommodate a further eighty boys. Any funds left over after this project is carried out—it is estimated to require £22,000—are to be divided equally between the Royal Merchant Navy School for the orphan sons and daughters of officers and men of the Merchant Navy at Bearwood, Wokingham, and the Prince of Wales's British Legion Pensions Fund. Lord Jellicoe took a great interest in the Bearwood school, and was to have broadcast an appeal on its behalf on the Sunday following his death; while the Pension Fund, as part of the activities of the British Legion to which Lord Jellicoe gave such unremitting personal service throughout the last years of his life, is an object for which he cared much. The Jellicoe Memorial Fund is worthy of the support of all who have the welfare of the Sea Services at heart.

NAVY WEEK.

Navy Week at the three Dockyard ports again proved more popular with the public than ever before. Admiral of the Fleet Sir Reginald Tyrwhitt performed the opening ceremony at Portsmouth with a speech from the cathead of H.M.S. Victory; the Lord Mayor, in his capacity of Admiral of the Port of London, officiated in the same capacity at Chatham. The total number of visitors to the three ports during the week was 433,239, an increase over the previous year of 100,232.

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MATERIAL.

New Construction.

After many years of naval reductions in the cause of economy, of postponed replacement of ships and replenishment of equipment, the tide has now turned; the dominant notes in naval administration to-day are expansion and acceleration. In the domain of new construction, as foreshadowed in the Defence White Paper of 1936,* the acceleration has been twofold. Not only is a return being made to the old practice of making substantial progress on the year's programme of new construction during the financial year—reversing the artificial and unsatisfactory practice introduced by Mr. Winston Churchill when Chancellor of the Exchequer of relieving the current budget at the expense of future years—but the work of shipbuilding has been pushed on more rapidly. The Admiralty wisely did not at first count on too great a measure of acceleration under the second head until it became clear how much the shipyards and other industries involved, depleted as they were of skilled men by so many years shortage of work, could achieve. The original programme, as outlined in the White Paper * and confirmed in the first Supplementary Estimate, 1936,† issued on April 28, provided for two battleships, one aircraft carrier and five cruisers, besides what had come to be regarded as the "normal" programme of smaller men-of-war. Not only was this programme larger than those of recent years, but it was to be put in hand more promptly; for nearly £3,000,000 was allocated to it for the current year, as against the £100,000 that had been customary under Mr. Churchill's "delay action" routine. By the summer, however, it had become clear that the resources of British industry would be by no means exhausted by the acceleration so proposed. A second Supplementary Estimate ‡ was therefore introduced on July 7, which added one aircraft carrier, two cruisers, an extra flotilla of destroyers and four more submarines to the year's programme, and provided for acceleration of the ships comprised in the original version of it, to the extent of three-quarters of a million sterling.

Battleships.

The placing of the contracts for the two battleships of the 1936 programme, Prince of Wales and King George V, with Cammell Laird and Vickers-Armstrongs was announced in the House of Commons on July 29. They were laid down on January 1 at Birkenhead and Walker-on-Tyne respectively. No details of them are yet available, beyond that their main armament will be of 14-in. guns.

The London Naval Treaty of 1936 § provides that the guns of battleships are not to exceed 14-in. calibre, but the limit may

* See "Brassey," 1936, pp. xii. and 313.
† See p. 323.
‡ See p. 326.
§ See "Brassey," 1936, p. 366.

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be raised to 16-in. unless it is accepted by all the Washington Powers —*i.e.* Japan and Italy as well as the original signatories of the 1936 Treaty—by April 1, 1937. But since the guns and mountings take longer to design and build than the ships themselves, it was not possible without seriously delaying the building of the ships to wait until the latter date before deciding the calibre of their guns. Many of the capital ships now building in Europe, however, mount guns of 11-in. to 13-in. calibre ; and even if after April, 1937, other Powers adopt 16-in. guns for their future ships, it is thus not necessary that all British battleships should mount that gun. The Admiralty therefore decided that it would be desirable, in view of the heavy programme of battleship replacement in prospect, to have done with postponements and make progress with it without delay, even if a higher standard in armament should later be set abroad.

No other characteristics of the new ships are yet known, and the forecasts which have appeared in various quarters are based on nothing more authoritative than intelligent speculation. The capital ships building by European Powers are credited with speeds such as have hitherto been associated only with battle cruisers, in the neighbourhood of 30 knots. As the new British ships will be comparable to these foreigners in armament, it seems likely that they will be given speed of the same order. If so, it seems unlikely that they will be much under the Treaty limit of 35,000 tons displacement, since it would be contrary to British policy to economise either on endurance or habitability.

It was announced in the House of Commons by the First Lord on December 16 that tenders for the battleships to be included in the 1937 Estimates—of which the number was not stated—would be invited shortly, though the orders, of course, would not be placed until after the ships had been authorised by Parliament.

Cruisers.

Seven cruisers in all were included in the 1936 programme, two similar to the "Southampton" class, of 9,000 tons and armed with twelve 6-in. guns, and five of a smaller class, of about 5,000 tons, of which no details are yet available. The orders for the two former, to be named Belfast and Edinburgh, were placed in August with Messrs. Harland and Wolff and Messrs. Swan, Hunter and Wigham Richardson respectively. Orders for the five latter, to be named Dido, Euryalus, Naiad, Phoebe and Sirius—all good old cruiser names—had not been placed up to the end of 1936.

Progress with the cruisers of earlier programmes was maintained. Of the "Southampton" class, the name ship and the Newcastle, of the 1933 programme, were due to complete very early in 1937. The Sheffield, Glasgow and Birmingham, of the 1934 programme, were launched on July 23, June 20 and September 1 respectively. The Liverpool, Glasgow and Manchester, of the 1935 programme, were laid down on February 17, September 22 and March 28 respectively.

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Of the smaller cruisers, the Penelope, of the 1933 programme, was delivered on December 18 and joined the Third Cruiser Squadron in the Mediterranean Fleet, replacing the Durban.

Destroyers.

The Hardy and the eight destroyers of the "H" class were all delivered by the end of January, 1937, and joined the 2nd Flotilla in the Mediterranean Fleet. The Inglefield and eight destroyers of the "I" class were well advanced by the end of December, nearly all of them having been launched. The Jervis and eight destroyers of the "J" class were authorised in the 1936 programme, but had not been ordered up to the end of the year.

The first seven destroyers of the "Tribal" class, authorised by the Supplementary Estimate of 1935, introduced on February 12, 1936, were laid down between June and August, 1936. Vickers-Armstrongs, Fairfield and Thornycroft are building two each, and Alexander Stephen one. The nine "Tribal" class destroyers authorised in the 1936 programme were laid down between August and December. Vickers-Armstrongs, Denny, Scott and Swan and Hunter are building two each and Alexander Stephen one. It is understood that these destroyers are to be of 1,850 tons displacement and to mount eight 4·7-in. guns. If so they will be comparable to the so-called "flotilla leaders" of various European navies.

Submarines.

The Narwhal, minelayer of the "Porpoise" class, 1933 programme, was completed early in 1936, and the Grampus on November 11.

The Rorqual and Cachalot of the same class, 1934 and 1935 programmes, were launched in July and laid down in May, 1936, respectively. The Seal, 1936 programme, is to be built by Chatham Yard.

The Seawolf, of the 670-ton "Swordfish" class, 1933 programme, was completed on January 11, 1936. The Spearfish and Sunfish, 1934 programme, were launched on April 21 and September 30, and the Spearfish was completed on September 5. The Sterlet, 1935 programme, was laid down at Chatham Yard on July 14.

A new design of "General Service" or "Patrol" submarine was introduced in the 1935 programme, and the Triton was laid down by Messrs. Vickers-Armstrongs in August, 1936. Four more of the same class, the Thetis, Triumph, Trident and Tribune, of the 1936 programme, were ordered later in the year from Vickers-Armstrongs, Cammell Laird (two boats) and Scott.

Three of a smaller type, the Unity, Undine and Ursula, of the 1936 programme, were ordered from Vickers-Armstrongs in November.

Sloops.

The Aberdeen and Fleetwood, of the 990-ton "Grimsby" class, 1934 programme, were completed in September and November respectively, and joined the Mediterranean and Home Fleets.

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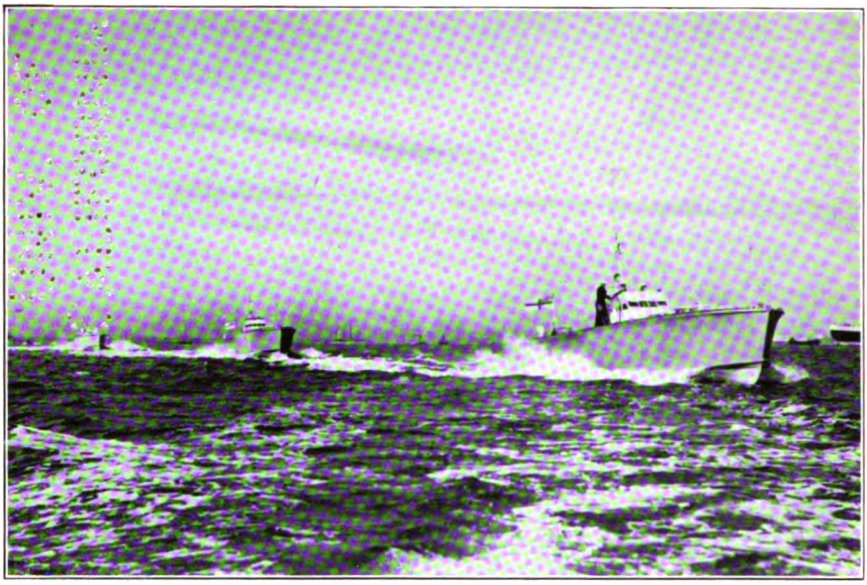

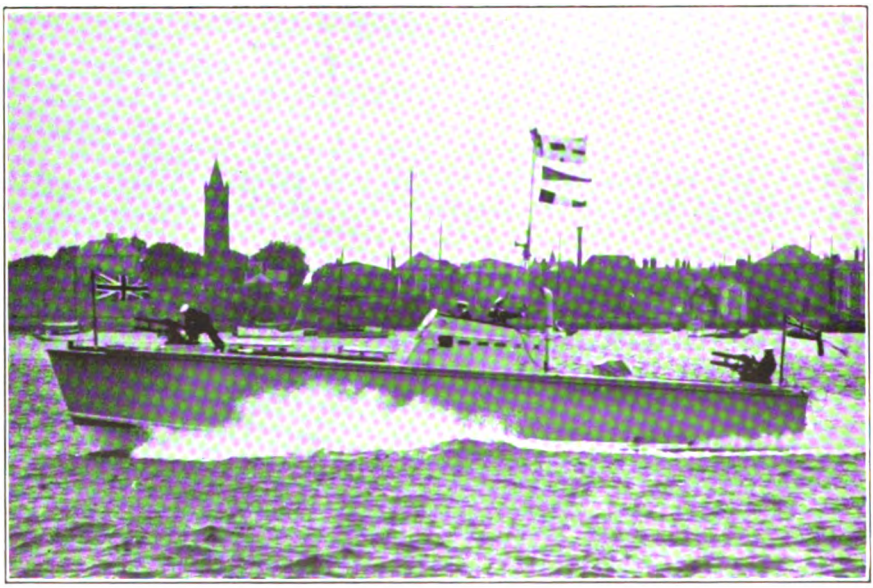

BRITISH MOTOR TORPEDO BOATS.

Commissioned for Service, 1936.

(By courtesy of the builders, The British Power Boat Co., Ltd., Hythe, Southampton.)

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The Niger and Salamander, of the 815-ton "Halcyon" (minesweeper) class, 1934 programme, were completed in June and July, and joined the 1st Minesweeping Flotilla. The Hebe and Sharpshooter, 1936 programme, were launched by Devonport Yard in October and December respectively. The Gleaner and Hazard, of the same programme and class, except that the former is fitted for surveying, are building by Messrs. Gray at West Hartlepool. Three more minesweeper sloops, the Gossamer, Leda and Seagull, are included in the 1936 programme. The Gossamer is to be built by Hamilton and the other two in Devonport Yard.

Of the convoy sloops, of which the Enchantress was the first to be completed, the Bittern of the 1935 programme is building by Messrs. White; the Stork of the 1934 programme, which is fitted for surveying, carried out acceptance trials from Messrs. Denny's in September. Two more, the Egret and Heron, are included in the 1936 programme, but up to the end of the year orders for them had not been placed.

Of the small coastal sloops of 585 tons ("Kingfisher" class), the Mallard and Puffin, of the 1934 programme, were completed in July and September, and joined the 1st Anti-Submarine Flotilla. The Kittiwake and Sheldrake, of the 1935 programme, were launched by Messrs. Thornycroft in December and January respectively. The Widgeon, of the 1936 programme, was ordered from Messrs. Yarrow in January, 1937.

The nomenclature of sloops has now been changed by an Admiralty order issued on January 15, 1937. The "Halcyon" class are to be known simply as "minesweepers"—a convenient contraction. The larger class, known hitherto as "patrol sloops" and "convoy escorts," are to be known as "escort vessels," while the smaller "coastal sloops" are to be called "patrol vessels."

Motor Torpedo Boats.

Six of these craft were included in the 1935 Supplementary Estimate, and were delivered during the year. A further six were ordered under the 1936 Estimates. These boats are of a new type, similar to the "rescue craft" supplied to the Royal Air Force, designed and built by the Power Boat Company of Hythe, Southampton. Accurate details of their design and capabilities are not available, beyond that they are 60 feet in length, with a displacement of 15 tons, and carry four small guns and two torpedoes. Their speed is said to be in the neighbourhood of 40 knots, and despite their rather awkward appearance, they have behaved exceedingly well in rough weather trials carried out off the Isle of Wight, proving themselves capable of maintaining 30 knots or over in a sea which a destroyer could not face at anything like that speed. These boats appear to have distinct possibilities, but there has not yet been enough experience of them in service to assess their true value.

The first six were attached to the Vernon on delivery, but it is understood that they may be sent abroad.

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Miscellaneous.

The Protector, netlayer, 1934 programme, was launched by Messrs. Yarrow on August 20 and was completed in January, 1937.

A special teak-built, non-magnetic, surveying ship, the Research, is being built by Messrs. Philip of Dartmouth. She will be rigged as a brigantine, but will be fitted with a Diesel engine under which she will have an endurance of 2,000 miles at 6 knots. She will take about two years to build and will cost in all about £100,000. Her first surveying task will probably be in the South Indian Ocean.

Two more surveying ships, the Jason and Franklin, were included in the 1936 programme, and orders for them were placed in August with the Ailsa Shipbuilding Company of Troon. Details of them are not yet public.

Besides other small craft and tenders, the 1936 programme provides for one river gunboat, the Scorpion, ordered in November from J. S. White.

Reconstruction of Older Ships.

The process of carrying out "large repairs" to existing capital ships and heavy cruisers has been going on steadily for some years as and when it became necessary. When "large repair" includes the provision of new engines and boilers, so much weight can to-day be saved by utilising modern advances in the design of steam machinery* that the process merits the designation "reconstruction." The reconstruction of the Warspite was nearly complete at the end of 1936; that of the Renown was taken in hand in June. It was announced in the House of Commons by the First Lord on December 16 that new engines and boilers were to be ordered for the Queen Elizabeth from Fairfield, and for the Valiant from Parsons.

PERSONNEL.

As in material, so in the domain of personnel there is now an atmosphere very different from that which has obtained of late years. In place of reduction of numbers, of small entries, of "axeings," of few promotions, of special measures to induce retirement so as to mitigate the blocking of the lists, with which the naval news of the post-war years has been filled, to-day the more cheerful signs of expansion are everywhere in evidence. Vote A—numbers borne—is increasing steadily. Larger numbers, both of officers and men, are being entered. Officers can no longer be spared for premature retirement; extended re-engagement is being encouraged; more promotions are being made, and the prospects of rapid advancement are now good for all ranks and ratings.

Vote A.

As mentioned in last year's "Brassey," the first increase in personnel was that of 3,500, for which the Supplementary Estimate of 1935, introduced on February 12, 1936, provided. That increase had actually been made before it was voted, under the stress of the

* See Chapter VIII.

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special measures rendered necessary by the emergency in the Mediterranean. The Supplementary Estimate merely legalised the action which had already been taken. The 1936 Estimates provided for a further increase of 4,613, and the Supplementary Estimate issued on April 28 asked for a further 2,063. This brought the total for the year to 101,154, exclusive of 892 Royal Marine Police. This was the first time since 1928 that the numbers of the Navy had topped six figures.

Naval Cadets and Junior Officers.

On May 30 the First Lord, Viscount Monsell, addressed a letter to the Press calling attention to the increased numbers being entered, and the improved prospects of those who do enter. He stated that it was the intention to enter 40 to 45 cadets a term for the Royal Naval College, Dartmouth, and that entries would probably remain at that figure for some years—actually, fifty-two were entered in December, 1936. The Special Entry would also be increased, and it was intended for the next four years to take from that source 100 cadets for the Executive branch, 36 for Engineering, 32 for the Accountant branch, and 40 for the Royal Marines.

In September, it was further announced that there would be an examination for the Special Entry in March, as well as those in June and November, making three for the year instead of the two hitherto held. At the same time the maximum age for Special Entry was raised to 18 years and 8 months. This last change was a wise move, and is likely to prove very valuable to the Navy. The Special Entry has not hitherto commended itself to schoolmasters, nor attracted the best candidates from schools, because boys who availed themselves of it had to leave school at an age which deprived them of the opportunity of being prefects or heads of their houses. That disability is removed by the raising of the age, and the advantage to the Navy is twofold. Not only does it give the Navy a wider choice, but also the boys who do enter the Navy will have had the great advantage of that period of their schooldays which is most valuable to the future officer, that is, the last year.

The number of Direct Entry cadetships (from the Mercantile Marine training establishments) has been increased from 10 to 18 annually.

In order to obtain an early increase in the number of lieutenants, not only are entries being increased, but the advancement of cadets and midshipmen is being accelerated. Cadets from Dartmouth are now to do only one term in the training cruiser (now the Frobisher, but shortly to be replaced by the Vindictive) before joining sea-going ships, instead of two, while cadets from the Mercantile Marine Training Establishments and Special Entry Cadets will do two terms instead of three. Midshipmen's time in that rank is reduced by four months to a total of two years, and the Greenwich course for sub-lieutenants is to be reduced to one term in 1937 and abolished thereafter. It will, however, remain at three terms for officers commissioned from the lower deck.

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The promotion of officers of the Engineering branch is to be kept in line with that of their contemporaries in the Executive branch, but the length of their courses is not to be reduced.

Commissions from the Lower Deck.

Four men from the lower deck were promoted to the rank of sub-lieutenant in 1936, and four to the rank of sub-lieutenant (E). The former is one more than in 1935, but except for that is the lowest number since promotion from the lower deck was reintroduced in 1912. It is understood that there has been no shortage of candidates but that there were many failures to pass the examinations. The number of sub-lieutenants (E) promoted from the lower deck remains at about the same figure at which it has stood for some years, but a further eleven passed the examination held in October, 1936. There is, however, in that branch an additional avenue to promotion through warrant rank, from which an average of between nine and ten have been commissioned annually during recent years.

Restricted Retirement.

In October it was announced by the Admiralty that they expected in future to be able to provide employment for all lieutenant-commanders up to the age of compulsory retirement, 45. Consequently retirement under the age of 40, which had been granted fairly freely of recent years to officers who desired it, would in future be allowed only in exceptional cases; and retirement between 40 and 45 would be granted only if the officer applying could be spared without inconvenience to the Service.

Officers for Physical Training.

Owing to the large number of new young entries, more officers were required to qualify as specialists in Physical and Recreational Training. It was announced in August that a course would be held in October, for which volunteers were invited. Qualified officers would be paid an allowance of 2*s*. a day.

Life Insurance.

It was mentioned in last year's "Annual" that the Admiralty were about to make arrangements to facilitate life insurance by officers of the Royal Navy and Royal Marines. The arrangements were concluded and promulgated in May, 1936, with a panel of three leading Life Assurance offices, whereby a standard policy "at reduced rates peculiarly suited to the needs of officers" is available to any who desire it. Any medical examination required may be carried out by a Naval Medical Officer. All risks, both of peace and war, including foreign service, flying and submarine risks, are covered, except that officers of the Fleet Air Arm, and those who engage in civil aviation otherwise than as fare-paying or official passengers—*i.e.* those who fly their own or other private planes for pleasure—are liable for an extra premium. The officers pay the first premium

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themselves to the Insurance Company, but later premiums are deducted from their pay and paid automatically through the Admiralty. These policies are available also for naval cadets and midshipmen, provided their parents or guardians undertake to be responsible for the premiums until the officers reach commissioned rank and can assume that responsibility themselves.

Civil Employment Committee.

The Civil Employment Committee continues to be of great service to retired officers. Employment or occupation was found for 151 in the year which ended on July 31, 1936, as against 133 in the year immediately preceding, and 103, 98 and 40, in the years before that.

Ratings.

For some years, in the interests of economy, the numbers of all ratings borne has been kept down to the bare minimum necessary to man the ships in commission, with a margin no larger than could provide for reliefs and training—indeed, at times it has proved barely large enough. The Mediterranean emergency proved the inadequacy of these numbers, and made it necessary to take special steps to provide for the increase required immediately—steps which were reflected in the 1935 Supplementary Estimate for 3,500 extra men. At the same time the decision to abandon the policy of unilateral disarmament and restore the Navy to a strength adequate to its responsibilities foreshadowed increases in numbers required in the future; and the later decision to accelerate that restoration made the demand for increase immediate. Not only do the new ships coming into service need larger complements than the older ones they replace, but there are to be more of them; so that the effect of the material increase upon numbers of personnel is twofold.

Most of the increase will eventually be made up by the larger numbers of seamen boys, young stokers and artificer apprentices now being entered. Such measures, however, cannot bear fruit for some years, and it has therefore been necessary to provide otherwise for immediate needs.

Re-engagement of Pensioners or Men who were Due for Discharge to Pension.

Men due for discharge to pension and those who have been pensioned for not more than two years have been encouraged to re-engage for any period up to five years, but not beyond the age of 50. The inducements offered were a bonus of one shilling a day, and the provision that men so re-engaging could either draw their pensions concurrently with the 1925 rate of pay or could count their extra service for increase of eventual pension, but would continue, apart from the bonus, on the rate of pay they were drawing at the end of their former service. Provision is made for this "fifth five" service to be gradually brought to an end in the course of the next few years, as the effect on numbers of the larger entries comes to be felt.

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Transfer from R.N.R. and R.N.V.R.

Ratings belonging to the Royal Naval Reserve and Royal Naval Volunteer Reserve who volunteered for temporary service in the Royal Navy were accepted for varying periods up to a year. The time so served was allowed to count, if they rejoined their original corps immediately on discharge from their temporary R.N. engagements, as embodied service for all purposes such as badges, progressive pay, medal, etc.

Acceleration of Promotion.

Various measures have been adopted to accelerate promotion to higher ratings in several branches. Amongst them may be mentioned the shortening of the normal period of service for Ordinary Seamen from eighteen months to fifteen, in certain cases to twelve. The minimum sea service necessary to qualify Leading Seamen for promotion to Petty Officer may now be waived, if necessary, for those who pass before having enough service; and in the event of failure to pass for Petty Officer, an extra attempt is now allowed, making four in all before final rejection. In order to ensure uniformity in the standard required for passing, examinations in each squadron are now to be conducted by squadron boards of examiners, instead of by the officers of each ship.

Boys' Training Establishments.

Besides the three existing training establishments—H.M.S. Ganges at Shotley, H.M.S. St. Vincent in Forton Barracks at Gosport and H.M.S. Impregnable (so re-named in February, 1936) at St. Budeaux Barracks, Keyham—two more are to be instituted. H.M.S. Wildfire, which will be located in the buildings which were formerly used as the Sub-Depot at Sheerness, is to be commissioned on March 1, 1937, by Captain J. Figgins, and will accommodate 500 boys and "special service" ordinary seamen. H.M.S. Caledonia is to be commissioned at Rosyth on April 1, 1937, by Captain Sir Atwell Lake, to accommodate 1,500 boys and 500 artificer apprentices. Eventually the Caledonia will be accommodated in buildings on shore, but as they do not yet exist and must take some years at least to build, the Admiralty acquired the White Star liner Majestic, which was about to be broken up, from the ship-breakers. She has been re-named Caledonia and will be berthed alongside the dockyard at Rosyth. She is being fitted out for her new service by Messrs. Thornycroft at Southampton.

Boys' Training Afloat.

In order to provide for the greatly increased numbers of boys passing into the service, and to avoid congestion in the Training Establishments of those awaiting draft on the completion of their courses, arrangements have been made for three battleships to be utilised for the first stage of their sea training. The Iron Duke, gunnery firing ship, which is not fully employed by her gunnery

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duties, was selected for the duty, together with the Ramillies and Royal Sovereign, of the Second Battle Squadron, Home Fleet.

Recruiting.

Recruiting for all branches of the lower deck, despite the great increase in the numbers required, has been satisfactory, with the single exception of the artificer branches. There is no shortage of candidates for Artificer Apprentices, but since entries by that avenue do not reach the sea service for five years, the Mechanical Training Establishments cannot provide for the increased numbers needed immediately. Fully trained Artificers have therefore been entered direct, and it is here that shortage has been experienced. The Navy, in this respect, is competing not only with the Royal Air Force—and to some extent with the Army—but also with private industry. The revival of industry, together with the rearmament programme—the former, indeed, arises partly out of the latter—have created a demand in the engineering industry for skilled men in numbers which practically do not exist. During the recent lean years the engineering firms have trained few apprentices, while the older skilled men have drifted away through unemployment, either abroad or into other occupations. Consequently, now that the demand has expanded once more, skilled men are at a premium and command wages ashore which make service rates of pay appear unattractive. They are not really so, if all the advantages—lodging, victuals, free medical attendance, leave allowances, etc.—enjoyed by naval ratings are taken into consideration; and when adequate steps have been taken to enlighten possible candidates on these points, the Navy will no doubt get its quota of young skilled men. But in the meanwhile there is a shortage.

The Navy, and indeed the Fighting Services generally, does not really compete with industry in this sphere. For although it takes its share of the youngsters available—or should take it—at one end, it discharges to civil life at the other end an equivalent stream of men much more highly skilled, either in the prime of life at the end of their first engagement or pensioners not very long past the prime of life. Indeed, no skilled mechanic discharged from the Navy nowadays has any difficulty in finding immediate, well-paid employment, and this should be an added inducement to youngsters to join as artificers. The Admiralty has enlisted the assistance of retired officers in all parts of the country in making these facts known in the appropriate quarters.

Training in the Dockyards.

Pending the provision of more establishments, already mentioned, for training apprentices, advantage is being taken of the resources of the Royal Dockyards. Arrangements have been made for Artificer apprentices for sea service to be trained there at the same time, and on the same terms as the Dockyard Apprentices, who have been accepted under indenture in the yards for many years.

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Marriage Allowance.

The marriage allowance for ratings on the 1925 scale of pay was increased in September, 1936, by 2*s*. per week. The increase was extended to Maltese ratings in the following month.

Marriage allowances, such as have been paid to men of the lower deck and to both officers and men of the other Defence Services for the last sixteen years, are still not yet payable to officers of the Royal Navy and Royal Marines.

Uniform.

Few changes in uniform have been made during the year, except that white shoes, for wear with white uniform, are now allowed for all ratings as an optional article of kit, and that tropical working rig for ratings is now regularised.

Paymaster midshipmen are in future to wear the round jacket, the collar patch and dirk, which have hitherto been the distinguishing marks of midshipmen of the Executive branch. This will entail more expense for the parents of paymaster midshipmen, but it is merely an extension of the system adopted of recent years whereby uniform and titles, once indicative of officers upon whom command might devolve, are now worn also by others to whom that description does not apply. The system was adopted in the first place for reasons of expediency rather than logic; but since it is in force, the above-mentioned extension of it is merely logical.

Review of Service Conditions.

The system of Review of Service Conditions, which has replaced that of the so-called Welfare Conference, was put into force for the first time during the latter part of 1936. Under this system, requests for modification of the conditions of service—pay, advancement, amenities, privileges, etc.—are formulated in each ship or units and forwarded through the officers under whom the authors are serving. Requests are collated in each command, investigated as necessary, and the results forwarded to the Admiralty for decision. This subject is dealt with at length in Chapter VII.

MISCELLANEOUS.

Toasts in Naval Messes.

The time-honoured custom whereby, in naval messes, the toast of the King's health is drunk sitting—a custom believed to have been authorised by the sailor King, William IV—is now officially recognised. A Fleet Order was issued in March, 1936, laying down that the toast of His Majesty the King is to be honoured seated in all naval messes, afloat and ashore, unless it is accompanied by the playing of the National Anthem or is coupled with the toast of the head of a foreign State. In those cases it is to be drunk standing.

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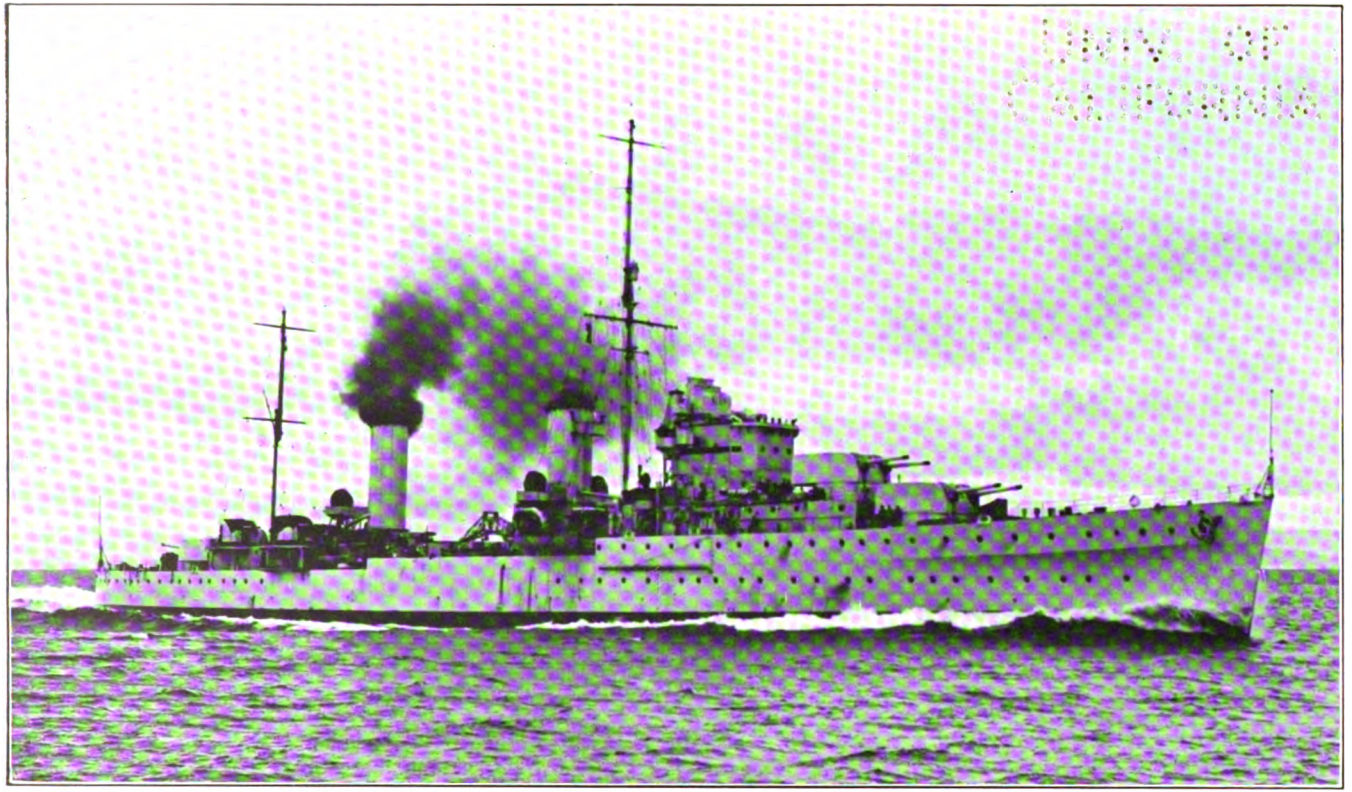

H.M. CRUISER PENELOPE.

Commissioned for Service, November 12, 1936.

(By courtesy of the builders, Messrs. Harland and Wolff, Ltd., Belfast.)

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The same Fleet Order details the exact procedure for the toasts to be proposed at official dinners in naval messes at which foreign officers or officials are being entertained.

DOMINION NAVIES.

Royal Australian Navy.

On April 20 Rear-Admiral W. T. Ford was succeeded in command of the Australian Fleet by Rear-Admiral R. H. O. Lane-Poole, C.B., O.B.E.

On August 10 Vice-Admiral Sir George Hyde, K.C.B., C.V.O., C.B.E., was promoted to the rank of Admiral in His Majesty's Australian Navy—the first officer of that Navy to reach the rank.

H.M. Australian ships Australia and Sydney arrived at Fremantle on August 2, and at Sydney on August 11, on their return from service with the 1st and 2nd Cruiser Squadrons respectively during the Mediterranean emergency.

A beginning is to be made with the building of men-of-war for the Australian Navy in the Commonwealth. A Flotilla Leader, which will probably be armed with 6-in. guns, is to be laid down in the dockyard at Cockatoo Island. It is intended that this ship shall be the first of a series of torpedo craft built there, but though the Royal Australian Navy, like the Royal Navy, is to be strengthened, it will probably not be possible for many years for that yard to provide for all its needs. It is intended shortly to modernise the anti-aircraft armament of the cruisers Australia and Canberra, presumably when they are due for long refit.

The cruiser Danae, temporarily attached to the China Station during the refits of the " Kent " class, visited Adelaide from December 23 to January 7 for the South Australian Centenary celebrations. She was under orders to visit also Melbourne, Sydney, Brisbane and Port Darwin before returning to Singapore.

Royal Canadian Navy.

The destroyers Cygnet and Crescent were transferred from the Royal Navy to the Royal Canadian Navy in February, 1937, and they were due to sail for Canada soon afterwards. These destroyers are two of the 1929 programme, in which year only four were built instead of the full flotilla of other years. These four thus do not fit into the flotilla organisation of the Royal Navy, and for that reason are appropriate for transfer. (The other two have been allocated to duty with the aircraft carriers of the Home Fleet.) The Crescent and Cygnet replace the Champlain and Vancouver (formerly Torbay and Toreador) in the Royal Canadian Navy, and the two latter are to be scrapped.

The destroyer Saguenay, escorting the Canadian pilgrims attending the ceremony of the unveiling by H.M. King Edward VIII of the Canadian Memorial on Vimy Ridge, arrived at Boulogne on July 24. She later visited Tilbury, whence her officers and ship's

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company were entertained in London, before going to Portsmouth, where she was open to the public during Navy Week. After cruising to the Channel Islands and visiting Brest, she left Portland for Halifax on September 4, arriving on September 12.

New Zealand Division of the Royal Navy.

H.M.S. Achilles, which had been transferred to the New Zealand Division in place of the Diomede, but whose joining was delayed through her retention in the Mediterranean during the emergency, arrived at Auckland on September 6. She later hoisted the broad pennant of the Commodore Commanding the New Zealand Division.

The Diomede, while still a unit of the New Zealand Division, had been detached for service at Aden during the emergency, and had returned to England in March. H.M.S. Leander, replacing the Dunedin in the New Zealand Division, was under orders to leave England early in 1937.

South African Naval Service.

Lieutenant-Commander H. N. C. Webber has been succeeded, as Officer Instructor of the South African Division, Royal Naval Volunteer Reserve, and Commanding Officer of the depot ship Afrikander, by Lieutenant-commander H. J. A. S. Jerome, R.N.

Mr. Pirow, Minister of Defence in the Union Government, visited England in the summer of 1936, for the purpose of conferring with the Government in the United Kingdom on various aspects of Imperial Defence. The results of his conferences were not made public, but he was generally understood to have indicated that the Union Government, while they were not in a position to provide a naval force of their own, were fully alive to the importance of naval defence to the Empire as a whole, and were arranging for such local contribution to it and co-operation in it as were within their power.

Straits Settlements Royal Naval Volunteer Reserve.

The Colonial Naval Defence Act, 1931, authorises any Colony to raise a force for naval defence, and, with the approval of His Majesty in Council, to maintain ships of war. This was put into force in the Straits Settlements in 1934, to the extent of forming a Royal Naval Volunteer Reserve, for which H.M. Sloop Laburnum was given by the Admiralty as a drill ship in 1935. An Order in Council authorising her maintenance was promulgated on March 13.

Gambia Royal Naval Volunteer Reserve.

A division of the Royal Naval Volunteer Reserve has been formed in Gambia, the necessary Order in Council being passed in May.

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CHAPTER II.

Foreign Navies.

Last year, in the introduction to this chapter, it was observed that it was the British Fleet in the Eastern Mediterranean, more than anything else, which had prevented the war between Italy and Abyssinia from spreading into a general conflagration. Since then the cockpit of international politics has shifted to Spain. In that unhappy country communism and anti-communism are being goaded by their supporters to fight to the death, while the ring is somewhat loosely held by the fleets of adjacent sea Powers. So far the activities of foreign naval units in Spanish waters have been chiefly devoted to rescuing their own nationals; but efforts which are continually being made to give effective support in the shape of volunteers and war materials to one side or the other are fraught with danger to international peace, and once again it is the British Navy which is virtually holding the balance between potential rivals.

The Spanish fleet, in its present condition, is an almost negligible quantity; but attention must naturally turn to the strength of the German and Italian fleets on the one hand and those of France and Soviet Russia on the other, as being the parties, other than Britain, most concerned in the situation. The new German navy is steadily increasing in numbers and efficiency, while Italy has shown that as a martial nation she is in a much higher class than she was given credit for before the Abyssinian war. Their ships are for the most part modern and fast, if somewhat lightly armoured, and the fleets of these Nazi-Fascist Powers have already the makings of a very powerful combination. France, too, has been steadily modernising her navy, and shows every sign that she intends to maintain her prestige as a sea-nation. It is difficult to obtain reliable reports from Russia, whose real achievements are always obscured by a smoke-screen of political verbiage; but there is no reason to believe that the Soviet navy has developed unexpectedly either as regards improvement in material or increase in the efficiency of its personnel. Germany would have no difficulty in keeping the Baltic fleet from menacing her territory, neither would Italy be embarrassed by the Black Sea fleet. In fact, as a partner at sea Russia would be likely to prove, once again, that she is not naturally a maritime Power, either strategically or temperamentally.

Certain aspects of the trend of design in foreign warships claim our attention. It is evident that most of the battleships building abroad will be given a speed approaching that hitherto credited to the battle cruiser. It is the business of our own battle fleet to bring enemy ships of its own kind to action and to destroy them; this it

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cannot do if it lacks speed. Better therefore to surrender an inch or so in calibre of guns (which can be offset by increased rate of fire) than for our battleships to be inferior in speed to those of their potential enemies.

The Second London Treaty has called a halt to the 8-in. gun cruiser so far as Britain, the United States, and France are concerned; but there has been a general tendency for some years to revert to the 6-in. gun as the cruiser weapon. The torpedo looks as if it will be relegated to light cruisers and smaller craft; it certainly did not justify its considerable claims on space in heavy ships during the Great War.

A new type of warship for anti-destroyer, anti-submarine, and perhaps anti-aircraft work, seems to be developing in the shape of such vessels as the French "Mogador" class with their eight 5·5-in. guns on a displacement of some 3,000 tons; the Polish (British built) "Grom" class with seven 4·7-in. guns on 2,200 tons; and the American "Porter" class with their eight 5-in. and the Japanese "Fubuki" class with six 5·1-in. guns, both on 1,850 tons. It is satisfactory to note that Britain is keeping abreast this development with the sixteen new "Tribals" armed with seven 4·7-in. guns on their 1,850 tons. It seems not illogical to expect that, in time, the demand for speed will necessitate dropping or reducing the torpedo armament in this class and reducing the gun armament of destroyers. In effect, this will produce two distinct types—the "fleet gunboat" and the "fleet torpedo-boat," instead of the present "destroyer," which is an endeavour to combine omnifarious functions in one type.

Lastly, in this summary, it behoves us to take very serious notice of the growing submarine flotillas of foreign navies. We are constantly, and rightly, reminded of the new menace to our existence of aircraft, but the old menace, which nearly brought us to our knees in the late war, is still very much alive. A most encouraging sign that this aspect of foreign naval development has not been overlooked by the Board of Admiralty is the recent mobilisation of our latent reserve of sea power in the form of the new Royal Naval Supplementary Volunteer Reserve. That force will do much to supply the personnel for an anti-submarine organisation, but what of the special craft which they are to man?

UNITED STATES.

The United States, like the other four parties to the Washington Agreement of 1922, and the other two who signed the major clauses of the London Naval Treaty of 1930, was free on the January 1, 1937, to build as large a fleet as they may, at any time, consider necessary. The units of this fleet will, of course, have to conform to certain restrictions agreed to in the London Naval Treaty of 1936. But the dominant factor in formulating all future construction programmes for the U.S. Navy will be what Japan does in the way of developing her fleet.

As Acting Secretary of the Navy, Admiral Standley said that the

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present building programme of over a hundred ships of all classes was necessary, but extraordinary; it was the result of failure to build any ships apart from a few cruisers for ten years. Such periods of sudden activity should not be necessary, and it would be possible to maintain the country's naval strength with a programme of between twelve and twenty ships annually when the present deficiencies had been made good.

The Naval Appropriation Bill for 1936–37 amounts to $531,568,707—a record figure for peace time. It provides for continuing the construction of eighty-four ships and for laying down twelve destroyers and six submarines. The Bill also authorised the President to lay down two new battleships any time after December 31, 1936, if any signatory of the London Treaty of 1930 should lay down capital ships. Provision is also made for increasing the enlisted strength of the navy by 6,500 to 100,000, and of the Marine Corps by 1,000 to 17,000 by the end of the financial year. Nearly $1,000,000 is allocated to the dredging of Pearl Harbour. It is also proposed to construct a floating dock to take the largest capital ships, which will ultimately be stationed at that naval base, but which could, of course, be moved to some other war base if necessary.

Battleships.

In the United States, as in this country, there is no lack of air enthusiasts whose volubility exceeds their intelligence, and who clamour for the abolition of battleships as being the easy prey of modern bombers. But the American Government have not found it necessary to have a special inquiry in order to justify support of the view of their responsible naval experts that battleships are still vital units in the navies of all first-class Powers. Rear-Admiral J. K. Taussig, the late Assistant Chief of Operations, remarked that "the battleship to the navy is like the infantry to the army. If we have a war that lasts long enough, they will be the last things operating."

Admiral Standley has announced that it is proposed to proceed with the replacement of the seven capital ships which will have reached the age limit of twenty-six years by 1942. Two new battleships, he said, will be laid down early in 1937 and the remaining five will be replaced gradually at the rate of one or two annually. Although no official announcement has been made, it is probable that a third battleship will be laid down during the financial year 1937–38. It is anticipated that the two ships of the 1936–37 Programme will cost $51,000,000 each. Later it was announced that the two first ships will be laid down on June 1, and that construction will take about four years. Rather unexpectedly, they will be inferior in speed to most of their contemporaries in other navies, as they will have a designed speed of 26–27 knots. Mr. Swanson, Secretary of the Navy, has explained this by saying that they were building battleships not armoured cruisers, and the slower speed would permit of heavier armour and guns. It is reported that the main

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armament will be either three triple 16-in. or three quadruple 14-in. turrets. If Japan—who is not a party to the new Treaty—should adopt a larger gun than the standard 14-in. agreed to, the United States will take advantage of the dispensation given in such circumstances, and mount 16-in. guns in their new battleships.

It is intended to re-equip the two 14-in. gun battleships California and Tennessee with a complete new and modern fire-control system, similar to that in the three latest 16-in. gun battleships. The Navy Department propose to increase the elevation of the turret guns of the older New York and Texas, and to modernise their anti-aircraft battery, main engines and boilers. It is also intended to replace the reciprocating engines and existing boilers of the Oklahoma by new and more powerful propelling machinery. It is desired to improve the "compartmentation" of all battleships except the Arkansas; many of these ships, it is stated, require improvements to enable them to withstand the shock of torpedoes and bombs. Although torpedo tubes have been taken out of battleships, there are still the very large submerged-tube compartments running right across the ship, and these should be subdivided.

Cruisers.

Admiral Standley is reported to have stated that he would like to have three cruisers laid down each year, commencing not later than 1937–38, so that by 1942 the United States would have about fifty cruisers. When asked what would be the effect on the policy of Britain building up to a strength of seventy cruisers, he said, "I don't know that we are going to attempt to reach parity in every small type of ship with the British Navy. We could hardly justify that and we never have." He is also understood to have changed his opinion regarding the utility of the 10,000-ton 8-in. gun type for all cruiser duties. As the result of experience in command of a squadron of those ships, he has come to the conclusion that certain naval work, especially inshore and in shallow waters, can be done better by a smaller type. In spite of this, the latest U.S. cruisers are all vessels of about 10,000 tons, although their armament has been reduced to 6-in. guns.

One 10,000-ton 8-in. cruiser, the Vincennes, is due for completion during 1937, and a second, the Wichita, the last of that type, in 1938. The first two ships of the "Brooklyn" class—10,000 tons and fifteen 6-in. guns—are due to complete in 1937; two more and the first three ships of the newer "Phœnix" class in 1938; the remaining two of the latter class, which have now been given the names St. Louis and Helena, in 1939.

The torpedo armaments have been, or are being, removed from all the 10,000-ton cruisers as well as from the battleships, and the policy of the Navy Department is to limit the torpedo as a weapon to lighter craft.

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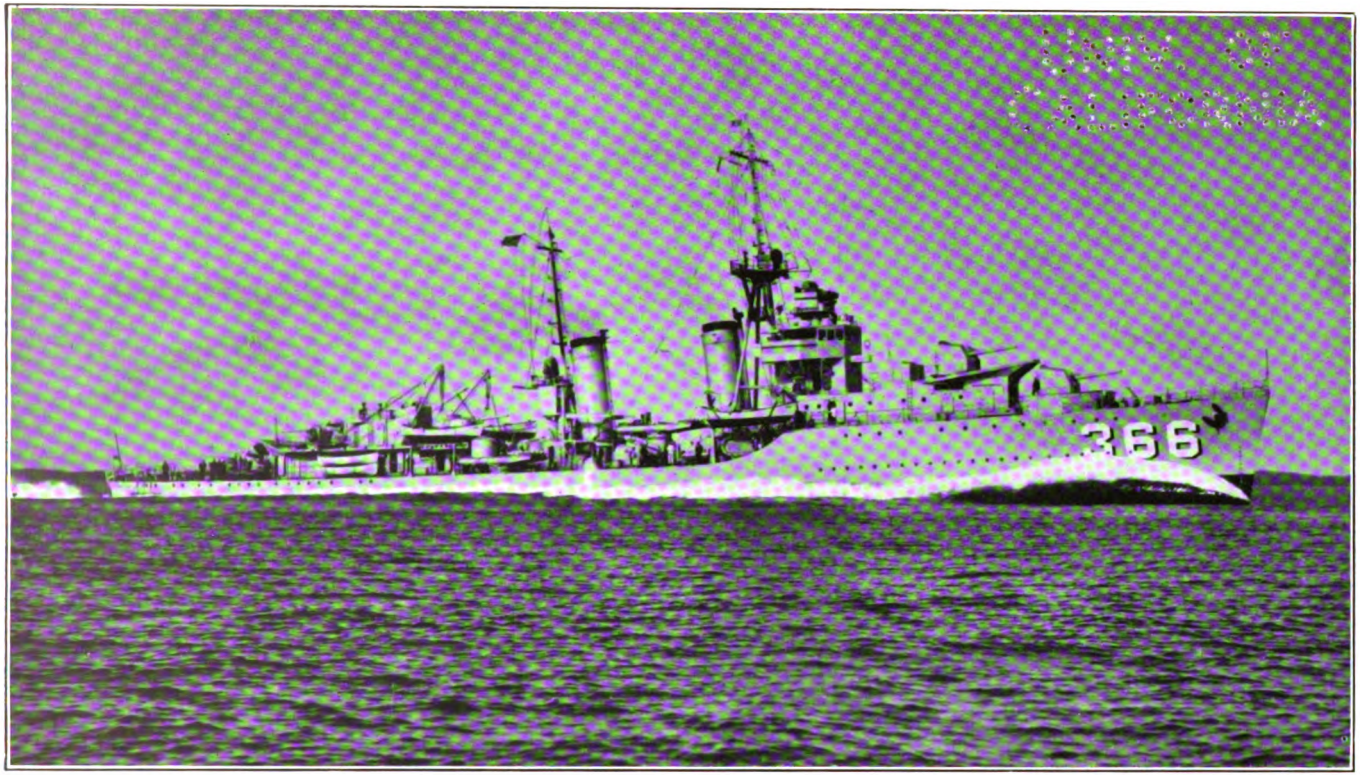

THE UNITED STATES DESTROYER DRAYTON.

Commissioned for Service, 1936.

(*By courtesy of the Navy Department, Washington.*)

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Aircraft Carriers.

The 20,000-ton aircraft carrier Yorktown was due for completion in March, 1937, and her sister ship the Enterprise in July. The carrier of the 1935–36 programme, originally known as CV.7, has been given the name Wasp. She was laid down in April, 1936, by the Bethlehem Shipbuilding Corporation, Fore River, and is due for completion in September, 1938. She is a small carrier of 14,700 tons —about the same displacement as the Ranger. The carriers Saratoga and Lexington are being taken in hand for improvements to flight and hangar decks, and the installation of a new anti-aircraft armament and new searchlights.

Destroyers and Leaders.

Britain having notified her intention of invoking the escalator clause in the 1930 London Treaty, the United States is also free to claim parity in the matter of destroyer tonnage. This means that both countries can retain vessels which would normally have been scrapped. In spite of this, it appears to be the policy of the Navy Department to scrap destroyers completed in and before the year 1917.

Three leaders of the 1,850-ton type are due to complete during 1937 and three more during the following year.

Eighteen destroyers of the 1,500-ton type should join the fleet during 1937, and ten more in 1938.

Of the twelve destroyers of the 1935–36 Programme—"Maury" class—seven are building in Navy Yards and the remainder in private yards.

The 1936–37 Appropriation Bill makes provision for twelve further destroyers; half of these will be built in Navy Yards and half in private yards.

It is reported that at least another twelve destroyers will be provided for in the 1937–38 Programme.

Some details of the construction and general characteristics of these torpedo craft will be found in last year's "Brassey."

Submarines.

One "Perch" class, 1,330-ton, submarine was completed during 1936. The remaining five of this class and one "Salmon" class are due to complete during 1937, and five more "Salmon" class in 1938.

Of the 1935–36 Programme three submarines have been allocated to the Electric Boat Co., two will be built in Portsmouth (U.S.) Navy Yard, and one at Mare Island Navy Yard.

The 1936–37 Appropriations Bill makes provision for six more submarines, and it is reported that a further six will appear in the 1937–38 Programme.

Naval Air Service.

The first-line strength, including reserves, of the Naval Air Service is, under the 1936–37 Appropration Bill, to be brought up to 1,259 aircraft by June 30, 1937.

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A non-rigid airship, known as G.1, has been acquired by the Navy Department and is based on Lakehurst. As it is reported to be over six years old, it is presumably only being used for training purposes.

The U.S. Marine Corps is to have a new aviation base in St. Thomas Island, one of the Virgin group. It is intended that the force which will be permanently stationed there shall eventually consist of two squadrons of 36 aeroplanes. The new base will provide a repair, storage, and fuelling station for naval and marine aircraft during the fleet manœuvres. It is also regarded as being of strategic importance in connection with the air defence of the Panama Canal.

Personnel.

The death of Rear-Admiral W. S. Sims at the age of 78 on September 28, 1936, recalled the personality of the man who did more than any one else to promote the efficiency and smooth working with the British Navy of those contingents of the U.S. fleet which came to our waters during the Great War. He owed his advancement before the War to the success with which he discharged the task of drastically overhauling the gunnery of the U.S. Navy, entrusted to him by President Theodore Roosevelt. After the War he was President of the Naval War College at Newport. He retired in 1922. He will be remembered with respect and affection by his many admirers in the British Navy.

A number of flag changes took place during the past year. Vice-Admiral A. J. Hepburn is now C.-in-C. of the U.S. Fleet. He was succeeded in command of the Scouting Force by Rear-Admiral W. T. Tarrant. Vice-Admiral W. D. Leahy is now Commander, Battle Force, and has been succeeded in command of Battleships by Rear-Admiral C. S. Kempff. Rear-Admiral F. J. Horne has been Commander, Aircraft Battle Force, and Rear-Admiral J. R. De Frees Commander, Submarine Force.

On January 1 Admiral W. D. Leahy was appointed to succeed Admiral W. H. Standley as Chief of Naval Operations. In consequence he has been relieved in command of the Battle Force by Rear-Admiral C. C. Bloch, who is promoted to Admiral. Rear-Admiral E. C. Kalbfus has left the Naval War College to command the battleships, Battle Force, with rank of Vice-Admiral, in succession to Vice-Admiral C. S. Kempff, who has been appointed Commandant, Mare Island Navy Yard. Rear-Admiral C. P. Snyder has succeeded him at the College.

Admiral Standley's tenure of the office which is equivalent to our First Sea Lord was not normally due to expire until July 1 of this year; but he received permission to retire from the active list on the earlier date at the age of 64 and after 45 years' service.

The Midshipmen's Practice Squadron now consists of the battleships Arkansas, Wyoming and Oklahoma, under the command of Rear-Admiral Wilson Brown. During the summer of 1936, over 1,140 midshipmen made an extensive cruise with the Squadron, visiting Portsmouth from 19th to 27th June.

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The 1936–37 Appropriation Bill makes provision for an increase of the enlisted strength of the Navy from 93,500 to 100,000, and of the Marine Corps from 16,000 to 17,000 by the end of that financial year. The manning requirements of the fleet, as it will be augmented in the course of 1937–38, will, it is estimated, necessitate a further increase of enlisted strength from 100,000 to 105,000.

European Squadron.

The European Station ceased to be a separate command with the withdrawal of the U.S.S. Raleigh in 1929; but the fact that the Oklahoma, Quincy and Cayuga happened to be on a summer cruise in those waters during the Spanish Civil War proved to be so opportune that, after some political opposition, it was decided to organise a new temporary European Squadron. This is designated Squadron 40 (T). It consists of the cruiser Raleigh, flagship of Rear-Admiral A. P. Fairfield, the destroyers Hatfield and Kane, and a coastguard cutter.

It is probable that the Squadron will be withdrawn when the Spanish situation is once more quiescent, because there is a strong desire in the United States that they should not become involved in Europe through some international incident which might arise out of the presence of their ships.

JAPAN.

Japan, having failed to carry her proposal for a "common upper limit of tonnage"—in effect a demand for parity with Britain and the United States as regards "global" (total of all classes) tonnage—withdrew from the Conference and took no further part in drawing up the Second London Naval Treaty. She is, therefore, entirely free to build as many warships and of whatever types she likes—a position which no first-class Naval Power has enjoyed since 1922. Whether she will actually initiate a "naval race" seems doubtful. Financial restrictions and the certain knowledge that Britain and the United States would combine to prevent the situation in the Far East from becoming completely unbalanced must influence her statesmen towards moderation in naval construction. In reality Japan, unless she pursues an unduly aggressive and acquisitive foreign policy, has no real danger to fear by sea save that which might arise out of a war with the Soviet Union, and it would seem logical that her first concern should be to counterbalance such sea and air forces as that Power might use to dispute the comparatively narrow waters which separate her from the mainland. The financial aspect of the situation must also be one for some concern. The Finance Minister has already expressed the view that there is a limit to the increase of deficit bond issues. According to some official figures, the Naval Budget for 1936–37 amounts to approximately £32,200,000 (552 million yen). The main items in this are: 54 million yen for modernisation; 21·8 million for reorganising

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dockyards; 10 million for reorganisation of artillery (presumably naval ordnance); 7 million additional expenditure on the air service and 6 million for maintenance and reorganisation of the existing air service; 5·5 million for "study and research of naval gunnery"; and 3 million for new units.

Japan, under the "escalator" clause of the London Treaty invoked by Britain, decided to retain certain tonnage which would otherwise have been scrapped. As she did not possess the 28,000 tons of extra destroyers which she might have claimed to retain, she has decided to keep 15,598 tons of submarines as well as 11,059 tons of destroyers.

It is understood to be the intention of the Japanese Government to preserve absolute secrecy in future regarding all details of naval construction, the publication of which will be confined to the types of the units and their tonnage.

Battleships.

The four oldest battleships are to be replaced by new vessels. These will form part of a third replenishment programme to be extended over five years, for which the estimated expenditure is 2,000,000,000 yen. No details are available as to the designs of the new ships, nor is it yet known whether they will conform to the terms of the Second London Naval Treaty in the matter of their main armament. A deterrent to any policy of increasing the calibre above 14 in. exists in the knowledge that the United States would at once follow suit.

According to a Press report, the modernisation programme has been pressed on vigorously, and will be practically complete in the current financial year. It is claimed that the improvements to them have been such that Japan's nine capital ships now have the same fighting strength as the fifteen of either Britain or the United States. Needless to say this statement must be regarded as being mainly for home consumption. Some details of the structural work which is being done were given in last year's "Brassey."

Aircraft Carriers.

The 10,000-ton aircraft carrier Soryu, laid down in November, 1934, is nearing completion at Kure. She is expected to have a speed of 30 knots with engines developing 60,000 h.p., and is to mount an armament of twelve 5-in. A.A. guns. A sister ship, the Hiryu, is building at Yokosuka. This will complete Japan's quota of such vessels under the provision of the Washington Treaty, the provisions of which, of course, expired with the close of 1936; but a third ship, the Koryu, is already provided for and is due to be laid down during 1937. In addition there are three aircraft tenders of about 10,000 tons building—the Chitose, the Chiyoda and the Miduho. These will, doubtless, replace the old converted oilers, Notoro and Kamoi. The Chitose was launched on November 29, 1936.

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Cruisers.

The following is the situation as regards cruiser construction: three of the "B" class, 8,500 tons, fifteen 6·1-in. gun cruisers—the Mikuma, Mogami and Suzuya—of the first Replenishment Programme of 1931, are completed; the fourth, the Kumano, is nearly completed. Of the two "B" class cruisers of the Second Replenishment Programme 1933, one is nearing completion, the other has not yet been launched.

Details of the armaments of these vessels were given in last year's "Brassey." It is understood that they are very lightly armoured. With a draught of under 15 feet and a lot of top hamper, it will be interesting to learn how they behave in a sea-way.

The 4,400-ton cruiser minelayer Okinoshima was completed in September of last year, and it is believed that she will be based on Yokosuka.

Destroyers and Torpedo Boats.

The twelve 1,368-ton destroyers of the First Replenishment Programme are complete. Fourteen more of a similar type are building under the Second Programme and should join the fleet during 1937–38. Some remarks on the design of these craft will be found in last year's "Brassey."

The four torpedo boats of the First Programme are complete. Of sixteen more of a slightly heavier type, provided for in the Second Programme, one is completed and all the remainder are building.

Submarines.

The First Replenishment Programme made provision for one "I" class (1,900 tons), six "Kaigun" (1,400 tons), and two "R" class (700 tons) submarines, all of which are complete. The Second Replenishment Programme provided for two "I" class and two "Kaigun" type, all of which have been laid down. It is claimed that, on an average, Japan's submarines are faster, at any rate on the surface, than most of those belonging to other countries. The latest types are credited with a speed of 20 knots; but this is exceeded by Britain's "Thames" class.

Naval Air Service.

The Naval Air Service is essentially a part of the Japanese navy, and all attempts to detach it from the navy or to merge it into a separate air service have been strongly resisted and emphatically rejected. The First Replenishment Programme made provision for fourteen new squadrons; the Second Programme for eight further squadrons, and the Navy Ministry considers yet a third programme is now called for. It is understood that the latter will concentrate largely on better training and improvements to material with a view to promoting greater efficiency.

With two new naval air bases opened during the latter part of 1936, there are thirty-nine of these bases in all.

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Naval Bases.

There can be no doubt that the Japanese government has adopted what may be described as a "forward policy" in regard to naval bases. Harbours in Formosa especially are being rapidly developed and fortified; according to a special article in a Hong Kong Chinese daily paper, sums amounting to 150,000,000 yen have lately been authorised for this purpose, and 1,300 labourers have been employed in renewing the defences of the port of Keelung at the northern end of the island. Admiral Siezo Kobayashi, a high war councillor on the reserve list, was appointed Governor of Formosa in August last. Admiral Osumi Nagana made an inspection trip of the South Sea Islands which are under Japanese mandate last year, ostensibly to report on them from an economic point of view. His report was most favourable to emigration. A South Sea Development Co. was formed at the end of last year; this concern is closely associated with the Formosa Development Co., and it is reported that, as in the case of the Formosa Co., the Government holding represents just over half of the company's capital and that the official investment takes the form of "property." While the objects of this company are ostensibly commercial, it is a clear indication that Japan intends that her mandate shall, in effect, be converted into permanent ownership. According to a Tokyo report, it is anticipated that a new governor will be appointed to administer these Islands in place of the present civil governor.

FRANCE.

One of the earliest acts of the new government was to establish a Ministry of Defence. A Minister of National Defence and War has been entrusted with the co-ordination of the three Departments—War, Marine, and Air. In effect, the Minister for War now combines the dual role of being head of his own department and a kind of Chairman of the Committee of National Defence; in fact, the equivalent of a Sir Thomas Inskip and Mr. Duff Cooper combined in one person. He presides over a Permanent Committee consisting of the Ministers of Marine and Air; Marshal Petain—a member of the Supreme Council of National Defence; the Chiefs of the General Staffs of the Army, Marine, and Air. Senior officials of the three Departments may also be co-opted as required. The first holder of this office is Monsieur Daladier.

Two other developments connected with higher organisation for war are the passage of a Bill relating to the nationalisation of war industries, and the creation of a National Defence College much on the lines of our Imperial Defence College.

The naval policy of the Popular Front Government was announced in the Chamber by their Minister of Marine last July as being to continue the post-war renovation programme, to undertake extensive additions, including the renovation of certain naval ports,

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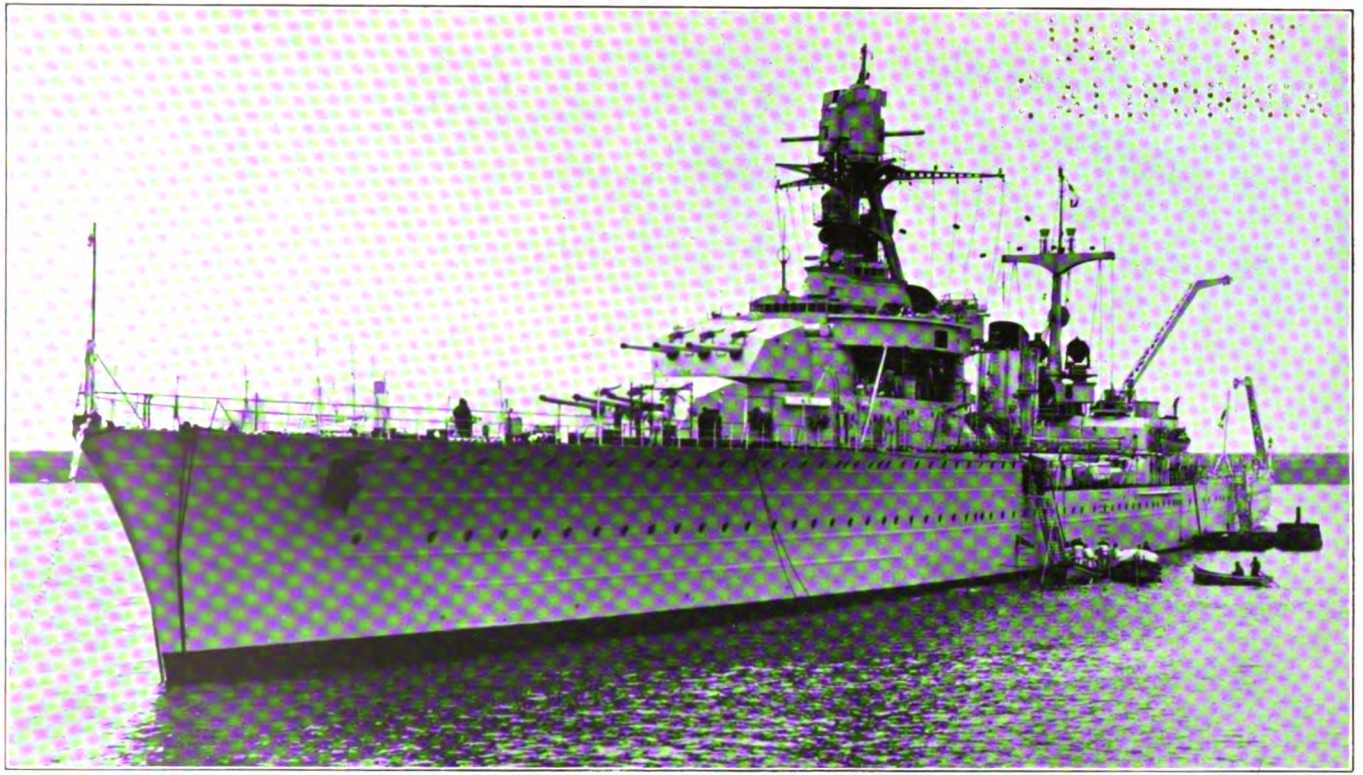

THE FRENCH CRUISER LA GALISSONNIERE.

Commissioned for Service, 1935.

(*By courtesy of the French Ministry of Marine.*)

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the provision of underground oil reservoirs, and the building of supply and other auxiliary craft.

On December 2 last, the Minister of Marine outlined a new naval programme to be completed by 1943. This is intended to counterbalance the increases to the German and Italian navies. The programme makes provision for five 35,000-ton battleships and ten 10,000-ton cruisers, also for the personnel which will be required to man the new ships, and for stocks of fuel and ammunition to meet all requirements.

Battleships.

The names of the first two 35,000-ton battleships have been changed from France and Patrie to Richelieu and Jean Bart. The former is building at Brest in three parts, and the latter was laid down on January 1 at St. Nazaire on the slip vacated by the Strasbourg. It is anticipated that these ships will take about four years to build. It does not appear to be the intention to lay down a third ship at present, but rather to concentrate on construction in hand.

The Strasbourg—a sister ship of the Dunkerque—was launched in December, 1936. Although she is due to complete in some fifteen months, a French writer has already called attention to the delay which is likely to arise with all new construction owing to the recently adopted 40-hour week.

The Dunkerque completed her trials before the close of 1936 and it is reported that her speed was in excess of the designed 29·5 knots, although the conditions as regards draught, etc., in which the trials were run have not been made public. She has joined the Second Squadron, now known as the *Escadre de l'Atlantique*. Full details of this ship were given in last year's "Brassey."

The old battleships Diderot and Voltaire, launched in 1909, have been condemned; the latter has been disarmed and taken into use as a harbour training ship.

The name of the old battleship Jean Bart, which belongs to the Instructional Division, has been changed to Océan.

Aircraft Carrier.

The construction of a new aircraft carrier is projected, but has been postponed to an indefinite date.

Four seaplane tenders are provided for under the 1937 Programme.

Cruisers.

A cruiser of 8,000 tons is included in the 1937 Programme.

The 7,700-ton cruiser Jean de Vienne is reported to have exceeded 36 knots on her trials. She and her sister ship the Marseillaise are joining the *Escadre de l'Atlantique* as they complete and, together with La Galissonnière, are to form a new fast cruiser division.

The Montcalm and Gloire, also of the 7,700-ton, nine 6-in. gun class, have left La Seyne and Bordeaux respectively, and are fitting

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out at Lorient. The last ship of the six, the Georges Leygues, was launched on March 24, 1936.

The Mogador and Volta—the remaining two super-flotilla leaders, which should really be classed as light cruisers—are at Lorient. Displacing 2,930 tons, they are 360 tons bigger than the previous ships of the class. They are expected to exceed the speed record of 42·253 knots held by Le Terrible. The Volta is expected to be ready for trials in May, 1937. They will carry eight 5·5-in. guns in turrets; four 1·5-in. anti-aircraft guns; and three triple 21-in. torpedo tubes. Their engines are designed to develop over 100,000 h.p.

Destroyers.

Two 1,850-ton destroyers are included in the 1937 Programme.

The 1936 Programme made provision for three 1,750-ton destroyers of "Le Hardi" class. They have been given the names Casque, Lansquenet, and Mameluck, all of which have been borne by French torpedo craft. They, with the two vessels of the 1935 Programme and Le Hardi laid down in that year, but belonging to the 1932 Programme, will complete a flotilla, all of a 1,772-ton type.

The only other torpedo craft building are the twelve small 608-ton *escorteur* class laid down in 1935–36, seven of which were due to complete in 1936.

Submarines.

It is reported that the big cruiser-submarine Surcouf, which had come to be regarded as something of a white elephant, acquitted herself very creditably in the exercises of the Second Squadron off Dakar and Agadir early in 1936. She had already made a successful training cruise to the West Indies.

There has been a definite slacking off in submarine building during the past year. There are only three first class, one second, "Aurore," class, and two coastal submarines now in hand. Four more of the "Aurore" class are provided for in the 1937 Programme.

Personnel.

Vice-Admiral Durand Viel has been succeeded as Chief of the Naval General Staff by Vice-Admiral Darlan. The new C.N.G.S. is said to be the youngest flag officer in the fleet. He is fifty-six. He has been actively associated with the renovation of the French Navy during the past ten years.

Early in 1936 steps were taken by the Ministry of Marine to make good the acute shortage of junior officers, both in the executive and other ranks. A certain number of *enseignes de vaisseau* and *ingenieurs mécaniciens* of the Reserve were, on their application, recalled to active service. The minimum period of such service is two years, which can be renewed by similar successive periods up to a maximum of ten years.

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Naval Air Service.*

A joint report was published by the Ministers of Marine and Air in August, 1936, which clarifies the organisation and control of the maritime air services. These have the comprehensive title of *Aéronautique Maritime*. The purely naval part of the organisation is called the *Aéronautique Navale*, and this is under the direct authority of the Minister of Marine, who constructs and maintains it from naval funds. It is manned by the Navy. The *Aéronautique Navale* is further divided into the *Aviation Embarquée* and the *Aviation Non-Embarquée ;* the bases, stores, and upkeep of the latter are also the property of the Navy.

The other part of the *Aéronautique Maritime* is the *Aéronautique de Co-opération Maritime*. This is part of the Air Force (*l'Armée de l'Air*) and consists of fighters, heavy bombers, and protective balloons specially intended for operation in liaison with sea forces. It has been given definite duties by the government and is not to be called on to carry out other duties. It is based at places selected by the two Ministries in consultation. It is placed at the disposal of naval Commanders-in-Chief for exercises and manœuvres.

Certain air bases, such as those at Cherbourg, Brest, Berre, Hyères, etc., and auxiliary bases for naval use in time of war are put at the permanent disposal of the Ministry of Marine.

Naval pilots are trained by the Air Force in accordance with the requirements of the Ministry of Marine. Air Force pilots attached to the *Aéronautique Maritime* are trained in naval matters by the Navy as agreed by the Air Ministry. Observers, naval ratings, and mechanics are all trained for naval air work by the Navy. The whole system seems to be far more logical in organisation, training, and command than the muddle of our Fleet Air Arm and Coastal Area.

ITALY.

At the time of the Italo-Abyssinian campaign, the Navy was somewhat overshadowed by the exploits of the Army and Air Force ; but it is now being realised that, apart from the fact that sea communications were vital to the conduct of the operations, the Italian Navy did indispensable work in connection with transport, disembarkation, base organisation, wireless communications, and medical services. The budget committee has published details of this work and has emphasised how important has been the part of the Navy in bringing the East African campaign to a successful issue. This will, doubtless, enhance the prestige of the service with the nation and facilitate naval development.

Naval expenditure budgeted for in 1936–37 amounts to 1,609,891,000 lire, which is an increase of 305,010,000 lire on the previous year. According to a communique issued by the government in October last, the Commissariat-General for War Manu-

* See also Chapter XII.

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factures has authorised certain factories connected with naval armaments to extend the working hours to a maximum of sixty a week.

Battleships.

The new 35,000-ton battleships Vittori Veneto and Littorio will have an armament of nine 15-in., twelve 6-in., twelve 3·5-in., and twenty A.A. machine guns. They will also carry four aircraft. It is anticipated that they will have a speed of about 34 knots.

The new armament of the reconstructed battleships Giulio Cesare and Conte di Cavour will be ten 12·6-in. (instead of the original thirteen 12-in.), twelve (instead of eighteen) 4·7-in., eight 3·9-in. (instead of thirteen 3-in. and six 3-in. A.A.), and twenty A.A. machine guns. The extreme length of the ships is being increased by 34 feet, and the draught by 1 ft. 9 ins. The displacement will be over 2,000 tons greater. The new engines are designed to develop 75,000 h.p., as compared with the original 31,000, and it is expected that the speed will be increased from 22 to 27 knots. These ships will also carry four aircraft each.

It appears that some doubt has arisen as to whether such extensive alterations to such old ships are worth the expense ; at any rate, the remaining two battleships, Andrea Doria and Caio Duilio, are not to be modernised, and are being converted into stationary technical training establishments.

Cruisers.

The two 9,000-ton cruisers Duca degli Abruzzi and Guiseppe Garibaldi, which were laid down at Spezia and Trieste respectively in December, 1933, were both launched on April 21, 1936, and are due to complete in 1937. Engined with two groups of Parsons reaction turbines, designed to develop 100,000 h.p., their contract speed is 35 knots. Their armament consists of ten 6-in. guns in four turrets ; eight 3·9-in. ; eight 1·5-in. A.A. guns ; and six 21-in. torpedo tubes. Each ship will carry four seaplanes, and is provided with two catapults.

With the completion of these two ships, Italy will have seven cruisers of the 10,000-ton, 8-in. gun type, and twelve of a modern type armed with 6-in. guns, besides eleven old vessels of lower fighting value.

Destroyers.

There are building four 1,498-ton destroyers—"Oriani" class—carrying four 4·7-in. and eight smaller A.A. guns, and two triple torpedo tubes. All these vessels will be fitted for minelaying. They are expected to have a speed of at least 38 knots. In addition, there are ten craft, classified in the Italian official list as torpedo boats, of the "Spica" type, under construction. In all there will be sixteen of these vessels when the present programme is completed. They displace about 650 tons and are armed with three 3·9-in., eight smaller A.A. guns, and four 18-in. torpedo tubes.

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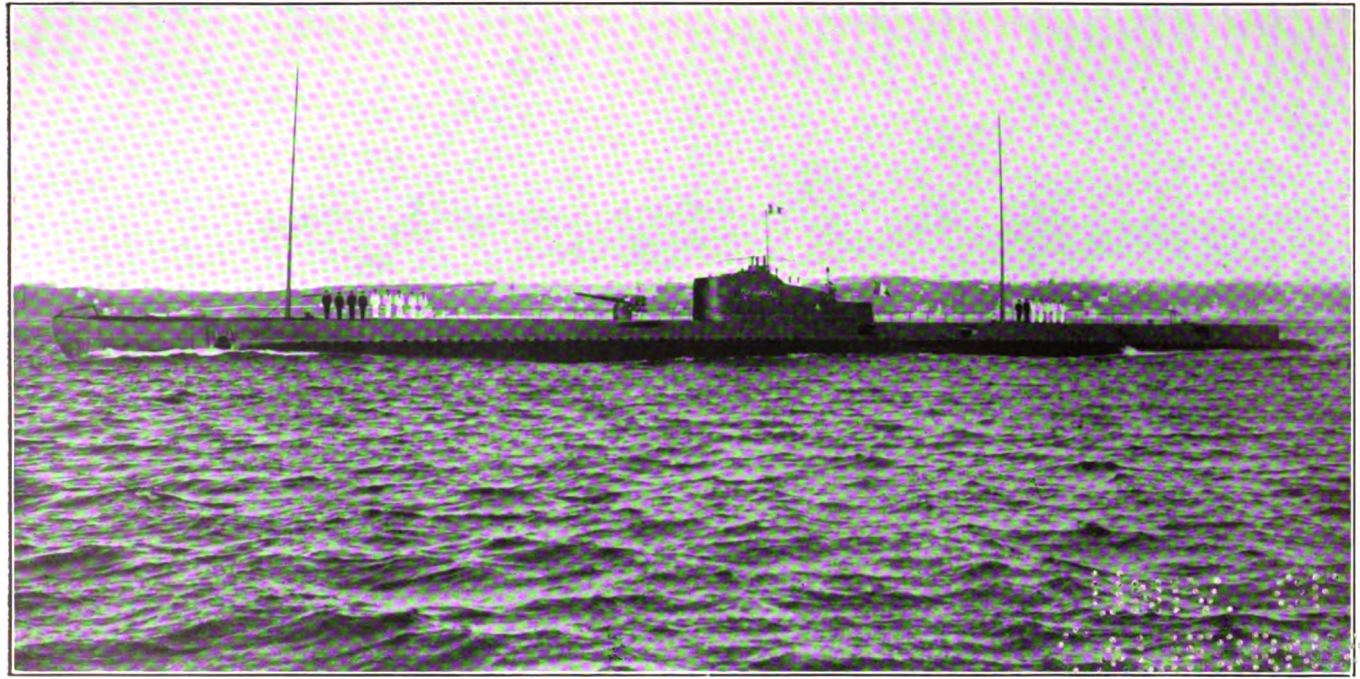

THE FRENCH SUBMARINE CASABIANCA.

Commissioned for Service, 1935.

(By courtesy of the French Ministry of Marine.)

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The current programme of torpedo craft also includes four convoy torpedo craft of 855 tons, armed with two 3·9-in. guns and four 18-in. tubes. Twenty-five motor torpedo boats were also due for delivery in 1936 or early 1937.

Submarines.

The programme of ten small coastal submarines of the "Perla" class, laid down in 1935, has been augmented by another ten craft of a similar type, all of which were laid down in 1936. In addition, there are two minelaying submarines, the Zoea and Foca, laid down in 1936, building at Taranto, and two small "sea-going" submarines—"Argo" class—completing at Monfalcone.

Personnel.

An increase of naval personnel to the number of 7,000 has already been approved. This, it is understood, only provides for ships already under construction in 1936, and not for any future programme of expansion.

Last year the establishment of Flag Officers was increased by two Ammiragli di Squadra—one on July 1, 1936, and one on January 1, 1937; two Ammiragli di Divisione—one on July 1, 1936, and one on January 1, 1938; and one Contrammiragli, on January 1, 1937. The Minister of Marine has also been given discretionary power to make the further increase of one Ammiragli di Divisione in 1939, and one Contrammiragli in 1940.

GERMANY.

Germany is pressing on with her naval expansion within the limits of the agreement with Britain arrived at in June, 1935. Early in 1936 it was announced that the *Marineleitung* had been considerably increased. The personal staff of the Commander-in-Chief of the Navy, Admiral Raeder, has been augmented, and the personnel of the Naval Staff Departments has been increased from forty-three to ninety-three. Under the new organisation there are Inspectors of Training, Torpedoes and Mines, Gunnery, and Engineering; the first three are under a Flag Officer, the latter under an Engineer Rear-Admiral.

Admiral Raeder was promoted to *Generaladmiral* on April 20, 1936, Herr Hitler's birthday. The old rank of *Gross-admiral*, equivalent to *Generalfield-marshall*, has only been held by the Kaiser, Prince Heinrich, and Admirals Tirpitz and Von Koester.

Admiral Richard Foerster, Commander-in-Chief of the German Fleet afloat since October, 1933, was succeeded on January 1, 1937, by Vice-Admiral Rolf Carls, who for the previous two years had been Admiral Commanding battleships.

New Construction.

A 35,000-ton battleship was laid down at Kiel last year, and a second ship is projected for 1937.

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The first of the 26,000-ton battleships, the Scharnhorst, was launched at Wilhelmshaven on October 3, 1936, and the second, the Gneisenau, at Kiel on December 8, 1936. Both these ships were laid down in 1934. They will be armed with nine 11-in., twelve 5·9-in. guns, and six 4·1-in. A.A. guns.

The third ship of the "Deutschland" class, the Admiral Graf Spee, was completed early in 1936, and became the Fleet Flagship. The Deutschland flies the flag of the Admiral Commanding the Battle Fleet. Both ships visited the Mediterranean in January, 1937.

A third cruiser, known as "J," has been added to the earlier programme of two 10,000-ton 7·8-in. gun vessels—the Ersatz Berlin and Ersatz Hamburg. All three are under construction.

A 19,250-ton aircraft carrier was laid down in 1936, and a second vessel is projected in 1937. No details have yet been published of their design. These will be the first carriers built for the German navy.

Sixteen destroyers of 1,625 tons, laid down in 1934 and 1935, are completing. A new class of six ocean-going destroyers of 1811 tons displacement were laid down in 1936. Twelve 600-ton torpedo boats were also laid down in that year.

Germany has forty submarines built or building; of these U1 to U24 are craft of 250 tons, armed with one 1-pdr. A.A. gun and three 21-in. torpedo tubes; U25 and U26 displace 712 tons and carry one 4·1-in. gun and one 1-pdr. A.A. gun and six 21-in. tubes; the remainder are craft of 500 tons, armed with one 3·5-in. gun, one 1-pdr. A.A. gun and five 21-in. tubes. The flotillas are being organised into: (a) Training: U1 to U6; (b) Weddigen: U7 to U24 (12 active and 5 in reserve); (c) Saltzwebel: U25 to U40. The two latter are named after submarine commanders who distinguished themselves in the War.

The ten 600-ton craft armed with 4·1-in. guns, four 3-pdr. A.A. guns, and two 1-pdr. A.A. guns and depth-charge throwers, classed as *Flottenbegleiter*, are complete and organised: 1st Escort Flotilla, F. 6 to F. 10; 2nd Escort Flotilla, F. 1 to F. 5.

Twelve 600-ton minesweepers, M. 1 to M. 12, were laid down in 1936. Two speed boats, armed with a machine gun and two torpedo tubes, are also under construction.

Personnel.

In order to provide for the necessary increase of officers, one of the steps taken has been to reduce the training of cadets from 3½ to 2½ years. A number of petty officers and ex-warrant officers have been given commissioned rank; over sixty officers of the Mercantile Marine have been given commissions in the Navy; and a special corps, consisting principally of officers who retired after the War, has been formed to relieve regular officers, employed in shore appointments, for service afloat. University students are being enrolled as Engineer, Intelligence, and Medical officers of the Naval Reserve.

Recruitment for the lower deck is being carried out in two

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groups : in the first are volunteers who join for four and a half years ; in the second are naval conscripts and others who join for two years. The majority of the seamen in the German Navy are in the long service group.

A new training squadron consisting of the old battleships Schlesien and Schleswig-Holstein and the cruiser Emden has been formed. The Schleswig-Holstein has been fitted out to take 180 cadets, all her guns except the forward four 5·9-in., and all the torpedo tubes have been removed, and she has been converted to oil-fuel firing.

A sailing training ship for cadets was ordered on November 1, 1935, laid down on February 15, 1936, launched on June 13, and commissioned on August 16 of that year. She can carry 200 cadets, and has a permanent crew of nine officers, thirteen petty officers, and thirty men. She has been named the Horst Wessel, after a Nazi poet who was killed in an affray with the Communists.

A Fleet Air Arm has been established as a special branch of the Air Force. This is known as the " 6th Air Command." The headquarters are at Kiel, and it comprises all coastal air stations. There are also seaplane training schools at List and Warnemunde, and a naval bombing, torpedo-dropping and air-gunnery school at Bug. The latest battleships and cruisers are all equipped with catapult aircraft.

Bases.

The island of Heligoland, which was demilitarised under the Versailles Treaty, is being restored as a base for destroyers and submarines. According to a French report, 11·8-in. navy guns and 10·7-in. howitzers are being mounted as part of the defences.

It is understood that Kiel is now the main battleship base, and that the dry docks there are being enlarged to take the new ships. A floating dock is also being provided. Cruisers use Wilhelmshaven. Emden, Bremerhaven, Swinemunde and Pillau are also being used increasingly as naval bases.

Note.—See Chapter VI for fuller details of the German Navy.

OTHER EUROPEAN COUNTRIES.

DENMARK.

The provision made for the coastal fleet in the financial year 1936–37 is appreciably larger than in the previous year. Noticeable increases are those for new construction, overhaul, and the maintenance of ships in commission. The grant towards new construction presumably relates to the three new submarines laid down last year. These submarines will be craft of some 300 tons displacement—slightly larger editions of the existing " C " class.

The old coast defence ironclad Olfert Fischer has been removed from the effective list. Before being broken up she was used as a target ship for bombing experiments. In these only light bombs were

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employed, and Rear-Admiral Rechnitzer, who was following the practices, has stated that out of three hundred bombs used only ten struck the ship. Both dive-bombing from a very low height and horizontal flying at between 4,000 and 6,000 feet were employed. On the other hand, the aircraft crews were inexperienced with ship targets.

ESTONIA.

Two submarines, the Lembit and Kaley, were launched at the Barrow shipyard of Vickers-Armstrongs on July 7, 1936. They are craft displacing 620 tons on the surface, and with a designed surface speed of 13·5 knots and under-water speed of 8·5 knots.

A fund has been opened, and collection will continue until April, 1937, for the purchase of a destroyer. About Kr. 120,000 is required. As the result of a similar collection in 1935, Kr. 160,000 was handed to the government for the purchase of a submarine.

NETHERLANDS.

The 1937 programme includes a gunnery training ship of 2,100 tons, to be armed with four 4·7-in. and eight smaller A.A. guns; two destroyers; two "K" class submarines; and a cadet training ship of 1,300 tons.

The cruiser De Ruyter carried out successful speed trials last year, attaining a speed of over 32 knots. She was fully commissioned for service in the East Indies on October 3, when she was inspected by the Queen of the Netherlands.

The small cruiser Tromp, building at Amsterdam, is to be used for training duties in home waters, where she will relieve the old coast defence ship Hertog Hendrik.

There are also in various stages of construction eight minesweepers, the first four of which were launched in the autumn of last year. They are vessels of 525 tons carrying one 4·7-in. gun and two double 12·7-mm. machine guns; they will be capable of being used as minelayers.

The submarine O.16, built by the De Schelde Company, was commissioned in October. She is the largest under-water craft in the Dutch Navy and has a surface displacement of 950 tons; the armament is eight 21-in. torpedo tubes, one 3·5-in. gun, and two 40-mm. machine guns; the surface speed 18 knots and submerged speed 9 knots.

In a memorandum issued in September, 1936, the Government stated that the existing international situation made it necessary to increase the naval personnel in the East Indies. This, incidentally, has resulted in an economy in the pay vote of the home naval Budget.

Read-Admiral H. Ferwerda relieved Vice-Admiral Van Dulm in command of the naval forces in the Netherlands East Indies early last year. It is intended to increase his fleet considerably as ships become available.

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NORWAY.

Financial restrictions continue to hamper progress in the Norwegian Navy. Only two small torpedo boats are building, and a third is projected. The first of these, the Sleipner, was launched in May, 1936, and was due for completion by the end of the year. She is a vessel of 715 tons, armed with three 3·9-in. and one A.A. guns, and one twin 21-in. torpedo tube. The designed speed is 30 knots. A sister ship, the Aeger, was launched in September, and is due for completion during the summer of 1937.

POLAND.

General K. Sosnkowski, Army Inspector and chairman of the Naval Defence Fund, stated publicly last year that Poland occupies sixth place in the tonnage of the navies of the countries on the Baltic, and "in order that our fleet should become a factor of political importance in peace and a strong weapon of defence in war, it is imperative that its strength should be quadruplicated within the next few years. . . . The realisation of this plan would demand the construction of new warships to a total of 6,000 tons per year." He said that the Marshal Pilsudski having been paid for by public subscription, the people would be able to say that a fifth of the submarine fleet had been provided by their efforts.

The two warships Blyskawica and Grom, launched in October and July, 1936, respectively, from the yard of Messrs. J. Samuel White & Co., Cowes, are really small light cruisers. They will displace 2,200 tons and be armed with seven 4·7-in. and four 3-in. A.A. guns and six 21-in. torpedo tubes; their designed speed is 38 knots. They are, therefore, slightly larger than the new British "Tribal" class and approximate to the large French flotilla leaders of the "Mogador" type.

Three 1,110-ton submarines are building in Holland; the Marshal Pilsudski is due to be launched during 1937.

The largest vessel at present in the fleet is the minelayer Grif. Displacing 2,227 tons, she carries six 4·7-in., two 3·5-in. A.A. guns, two twin 40-mm. machine guns, and 300 mines. Her speed is 20 knots.

Poland has a very active Navy League which is energetically backed by the naval authorities.

PORTUGAL.

A repercussion of the Spanish Civil War was the attempt made by the crews of the sloop Alfonso d'Albuquerque and the destroyer Dao to leave Lisbon and join the communist naval forces in Spain. The government appear to have had timely warning and the coast defences were given orders to prevent the ships leaving harbour. Both ships were badly damaged by the land batteries, the Alfonso d'Albuquerque having to be run ashore to prevent her sinking; six mutineers were killed and nine wounded. This outbreak seems to

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have had little or no sympathy in the rest of the fleet, and to have been due to Red propaganda during a visit to Alicante. The commanding officers were placed on the retired list. According to a Press report, sentences ranging from sixteen to twenty years have been awarded to ringleaders of the outbreak.

The small sloop João de Lisboa (ex-Infante D. Henrique) was launched on April 21, 1936. She will be the last ship to be built in the old Naval Arsenal. Future construction is being undertaken in the new arsenal at Alfeite.

The destroyer Douro, the hull of which was built in Lisbon to Yarrow and Co.'s designs and under their supervision, and which is fitted with machinery and boilers supplied from Yarrow's Glasgow works, carried out successful trials early in 1936 and has been handed over to the Portuguese Government. She attained a speed in excess of 37 knots, the contract speed being 36 knots. The Douro is the last of a series of destroyers ordered from that firm; all are giving highly successful results under service conditions.

SPAIN.

A remarkable feature of the Spanish Civil War, which has been raging since July of last year, is the influence which sea power, or the lack of it, is having on the fortunes of the combatants. It was a vital matter to the Madrid government that the insurgents should be denied sea transport from Morocco, where the revolution originated and on which the latter were largely dependent from the outset for man-power and supplies. A patrol of the Straits was instituted, and the rebel headquarters at Ceuta was bombarded from the sea, and at first General Franco had to rely on aircraft to fly small sections of troops across to Cadiz and Algeciras. But political influences soon wrought havoc with the efficiency and discipline of the government warships; in some vessels the crews mutinied and murdered their officers, and control passed into the hands of irresponsible "soviets." As the crews came largely from the Northern Provinces, it was a popular decision that the ships should return and enable the men to protect their homes, regardless of the interests of the country as a whole. On September 29 a destroyer, the Juan Ferrandez, and an armed trawler, left to guard the Straits, were sunk, since when the insurgents have had a free hand in those waters.

A government attack on Majorca, supported by two leaders, two submarines, four transports and many small craft, took place in September; but it failed and the troops had to re-embark with fairly heavy casualties. Since then the island has been in the hands of the insurgents, for whom it is a valuable base.

The battleship Jaime I was bombed at Malaga by insurgent aircraft. According to reports at the time she was holed both sides, plating 30 ft. by 20 ft. and 50 ft. by 30 ft. being blown out to a depth of two decks, while the casualties were 47 killed and many injured. She proceeded to Cartagena under her own steam for repairs. As these are reported to have been completed in less than

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three weeks, it seems probable that the damage was exaggerated. Both this ship and the cruiser Libertad have been subjected to further air attacks, but without results.

The cruiser Miguel de Cervantes was torpedoed on November 22 while lying at anchor in Cartagena Bay. She was struck twice abreast the after-funnel and much damage was done to boiler-rooms below the water-line. She took a 10° list, but was towed into harbour. She is likely to be laid up for several months. The attack was probably made by an insurgent submarine.

Spain's only other battleship, the Espãna, has joined General Franco's fleet. Admiral Don Juan Covvera Valderrama has been appointed Chief of the Naval Staff of the Insurgent naval forces, and all officers, retired or supernumerary, have been called up to reinforce them.

Many naval officers have been shot by so-called "government" authority, amongst them being Rear-Admiral Azarrola, who commanded the naval base at Ferrol, and ten officers of the destroyers Churruca and Sanchez Barcaiztegui, who failed to bombard Moroccan ports and embarked insurgent troops for Spain. They were arrested by their crews.

Earlier in 1936 a Decree authorised the *Sociedad Espanola de Construccion Naval* to build two 1,500-ton minelayers in the yard at Ferrol. There are also four 2,000-ton minelayers in various stages of construction at that port.

Three 1,050-ton submarines are under construction at Cartagena.

SOVIET UNION.

The only up-to-date information about the naval forces of the Soviet Union comes from German sources; in view of the political relations between the two countries, this must be accepted with reserve. Two German Press reports, between them, give the following details of the strength of the Soviet fleet in 1936:—

Baltic Fleet.—Two battleships, one cruiser, eight destroyers, three torpedo boats, sixty fast motor-boats, forty submarines, two minelayers and sixteen minesweepers.

White Sea.—Six destroyers, five torpedo boats, and six submarines.

Black Sea.—One battleship, four cruisers, five destroyers, two torpedo boats, twenty submarines, twenty fast motor-boats, and a number of minelayers and sweepers, etc.

Far East.—Thirty submarines, thirty fast motor-boats, six gunboats, and a number of minelayers and sweepers, etc.

Amur River.—Seventy-five armed motor-boats and thirty-two river gunboats.

The forty submarines in the Baltic are stated to be craft of 900 tons, armed with eight torpedo tubes and two guns; they are fitted for minelaying. The new Dekabrist type has an endurance of 7,000

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miles at 9 knots. The torpedo boats of the "Taifur" class (470 tons) are actually fast minelayers, each carrying forty mines.

The Kotlin Yard has been developed as a submarine harbour.

Naval exercises were carried out by the Baltic fleet in the autumn of last year, and according to a Soviet Press account they included a forced landing and attacks on the fleet by C.M.Bs.

A Soviet newspaper has also given an account of the work going on at the new Archangel shipyard. Apparently considerable difficulties are being met with owing to the nature of the ground and the lack of skilled labour in that district. The annual freezing and subsequent ice-flow of the North Dwina River must also cause considerable interruption of work on the water-front. Archangel, as a port, has a limited value, because the White Sea is frozen for some six months of the year and for part of that time is unnavigable even with the aid of ice-breakers.

SWEDEN.

The administration of the "defence forces" of Sweden has been reorganised, and as from the middle of last year the Army, Navy, and Air Force have each been placed under the command of a separate Chief. Vice-Admiral C. L. de Champs was appointed "Chief of the Navy" up to the end of June, 1937. His duties relate to the training, organisation, equipment, and personnel of the fleet. As head of the Naval Staff he is also responsible for the direction of naval operations.

The Coast Artillery and fortifications are also part of the responsibilities of the Chief of the Navy. There are six Naval Districts—Norrland Coast, East Coast, Gotland, South Coast, Cresund, and West Coast—each under a Naval District Chief.

The Coastal Fleet consists of three coast defence ships (small battleships), one aircraft carrier, eight destroyers, eight vedette boats and minesweepers, ten submarines, and certain miscellaneous craft. A programme of new construction, to be spread over ten years, includes two destroyers of the Göteborg type, one small destroyer and six submarines; of these the two first and three of the latter are building. The "Sverige" class coast defence battleships are to be modernised to some extent. The total cost will be 53,000,000 Kronen.

On her trials the Göteborg attained a speed of 40·02 knots. At that speed her engines were reversed and the ship was brought to a standstill in three-quarters of a minute, having run only a ship's length and a half, when she immediately started to move astern. On a six hours' run she maintained a speed of 39·6 knots.

The question of a new type of small battleships is being investigated; in this connection some little difficulty may arise if Sweden wishes to become a partner in the new Naval Treaty, as the design of a ship which would best suit her naval requirements might be found to fall within the existing prohibited range of tonnage and guns, *i.e.* 8,000 to 17,500 tons and a calibre of less than 10-in. for the main

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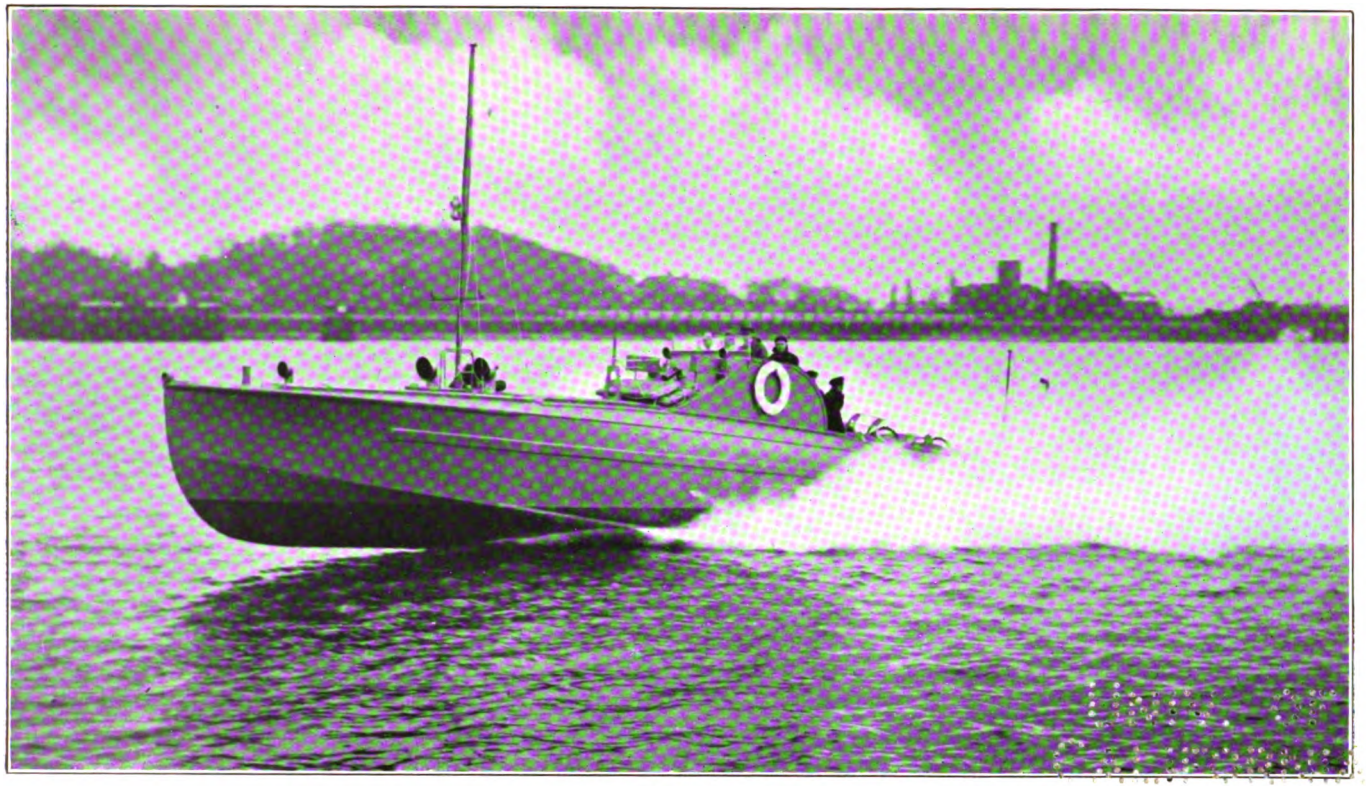

MOTOR TORPEDO BOAT.

55-ft. Craft supplied to a Foreign Power, 1936.

(By courtesy of the builders, Messrs. J. I. Thornycroft and Co., Ltd., Woolston, Southampton.)

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armament of capital ships. These restrictions were, according to the terms of the Treaty, included in order to prevent the introduction of a type which would be within the definition of a capital ship, but really a superior cruiser.

The question of augmenting the personnel of the fleet is also being considered, as new construction will necessitate a considerable increase, especially of officers. Promotion is also being looked into with a view to improving the chances of individuals.

The new Chief of the Navy has already emphasised that naval defence must be based on co-operation between naval forces and aircraft: neither arm can act as a substitute for the other. He also desires to see provision made for the supply of six motor torpedo boats—half a flotilla—during the budgetary year 1937–38, to be followed by a further six to complete a full flotilla of twelve of these craft.

YUGOSLAVIA.

Orders for the hulls of three destroyers have been placed with the Chantiers de la Loire; the machinery and boilers for them are being supplied by Messrs. Yarrow; and the 4·7-in. guns by a Czechoslovak armament firm of Skoda.

A sum of 35 million dinars has been allocated to the purchase of new aircraft for the naval air arm, and it is understood that the authorities favour a twin-engined hydroplane which could be used as a bomber, a torpedo bomber, or for long-distance reconnaissance.

SOUTH AMERICAN COUNTRIES.

ARGENTINA.

The Argentine Navy includes ships built in Britain, the United States, Italy, Spain, and Germany. With so much experience it is interesting to find that the orders for the main part of the new construction programme have once again been placed in this country. Vickers-Armstrongs are completing the 7,000-ton training cruiser laid down in 1935 and due to be handed over before the end of 1937, details of which were given in last year's "Brassey"; the same firm is building three destroyers to an order placed in June, 1936; John Brown and Co., and Cammell Laird and Co., are each building two destroyers, making seven of these craft in all. They will be similar to the British "G" class. Five more of the same type are projected.

Seven small minesweepers, previously described as sloops, are in various stages of construction at home. Four were allocated to the naval base at Rio Santiago and three to private yards. They have a displacement of 520 tons, a speed of 14 knots with Diesel engines, and they carry an armament of two 3·9-in. guns. They will replace the ex-German "M" class minesweepers purchased in 1922.

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A sum of about £500,000 has been voted towards the provision of a Naval School, to be built at Rio Santiago. A further sum of £230,000 is to be devoted to acquiring motor-launches and boats for training.

It is also proposed to construct a naval dockyard at Rio Santiago capable of building ships up to 8,000 tons.

BRAZIL.

The sea-going fleet consists of the battleship São Paulo, flying the flag of the Commander-in-Chief, the cruisers Bahia—flag of the Rear-Admiral—and Rio Grande do Sul; eight destroyers and their depot ship; and a fleet repair ship. There are also various small craft and auxiliaries belonging to the Hydrographic service and river flotillas. The battleship Minas Geraes is still undergoing modernisation, some details of which will be found in last year's "Brassey."

The new construction programme includes two cruisers, ten destroyers, two or more submarines and six minesweepers; but most of it is held up through lack of funds.

The old coast defence battleship Florinao has been removed from the effective list.

CHILE.

The Chilean fleet in effective commission now consists of the battleship Almirante Latore—flagship of the Commander-in-Chief; the armoured cruiser General O'Higgins; the protected cruiser Blanco Encalada; a flotilla of six destroyers; three submarines; and various auxiliaries. The older coal burning destroyers have been paid off. The old cruiser Chacabuco has been undergoing a refit; on completing she will relieve the Blanco Encalada, the latter going to Magellanes as station ship.

The fleet carried out a winter instructional programme of exercises and gunnery practice during August—September, 1936. The Minister of Defence, the Director-General of the Navy, and other officials embarked in the Almirante Latore to witness the firings.

ECUADOR.

A retired Commander and Lieutenant-Commander of the U.S. Navy are assisting to establish a naval school.

MEXICO.

A novel type of warship is represented in the five transport gunboats, all built for Mexico in Spanish ports. The Queratarо and Guanajuato, built in the Ferrol yards, displace 1,300 tons; they have an armament of 4-in. guns and machine guns, and the estimated speed is 20 knots. They are capable of transporting 30 officers, 200 men, and 20 horses. The Potosi, building at Cadiz, is a sister

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ship. The Zacatecas, built at Cadiz, and the Durango at Valencia, are slightly larger vessels. Displacing 1,600 tons, they have accommodation for 40 officers, 450 men, and 80 horses.

ASIATIC COUNTRIES.

CHINA.

The cruiser Ping Hai, laid down at the Kiangnan Dock Company's yard, Shanghai, in 1931, is at last completed. Work was suspended from 1933–35, presumably due to the disturbed state of the country and lack of funds. Her machinery and armament, like those of her sister ship, the Ning Hai, already in service, are supplied from Japan. These are ships of 2,500 tons, carrying six 5·5-in. and six 3·4-in. guns, four 21-in. torpedo tubes, and two aircraft. The designed speed is 24 knots with 10,500 h.p.

SIAM.

Extraordinary exertions are being made to increase Siam's Navy. Japan is materially assisting in this by undertaking a large share of the construction programme. There are building in the latter country for the Siamese fleet two coast-defence ships of 2,200 tons armed with four 8-in. guns in twin turrets; four 370-ton submarines; five patrol vessels of 130 tons; a 2,000-ton oiler; and two training sloops.

Italy is providing nine torpedo boats of 460 tons, carrying three 3-in. guns and six 18-in. torpedo tubes. The first two of these craft attained a speed of 32·5 knots and have been delivered at Bangkok. There are also building in that country two minelayers of 400 tons.

A further programme includes three more torpedo boats, two minelayers, two sloops, four submarines, and an oiler.

Sixty naval officers and cadets made an educational tour through Italy last summer.

E. A.

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CHAPTER III.

Relative Naval Strength.

From January 1, 1937, the Washington Naval Treaty of 1922 and the London Naval Treaty of 1930 have ceased to be operative, and there is now no check on the numbers of ships which may be built by the former signatories to these pacts. Quantitative limitation of the five leading navies of the world, that is to say, is definitely at an end. To what extent some limitation of competition may result from the London Naval Treaty of 1936 it is too early yet to determine. This treaty does not come into force until ratified, and only the United States has, at the time of writing, taken that step. Great Britain and France are likely to do so as soon as an extension of the provisions of the treaty to other naval Powers has been arranged by means of the bilateral talks which have been in progress for several months.

Meantime, there is no substantial evidence to show that the Powers are taking advantage of their freedom from treaty restrictions to introduce unduly large new programmes of construction or new types of vessels greatly superior to those which preceded them. They may, of course, still do so. A warning in this direction was given by Mr. Winston Churchill, who wrote * :—

> In the trammels of the treaties we have been forced to build at great expense unsuitable types of ships not based on any true conception of naval warfare. Both Great Britain and the United States have large numbers of these ten-thousand-ton Treaty cruisers, the bulk of which are thoroughly bad specimens of naval architecture.
>
> Japan or Germany, lying outside the new Treaty, enjoy perfect liberty, and can easily call into being types which will decisively surpass the best vessels in our existing cruiser fleet.

Japan, however, so far as her new programme has been made known, appears to be concentrating on light cruisers and high-speed minelayers, aircraft carriers of medium displacement, and torpedo craft, particularly submarines. Germany's programme is following the lines which might normally be expected. Her battleships, cruisers, aircraft carriers and submarines are within the Washington Treaty limits ; her destroyers (1,625 tons and 1,811 tons) exceed the limit of 1,500 tons for destroyers, but not that of 1,850 tons for flotilla leaders, although here it should be noted that these limitations have been rendered obsolete by the merging of cruisers and destroyers into one group as " light surface vessels " in the London Treaty of 1936.

Except for the re-emergence of the German Fleet following the abrogation of the Treaty of Versailles, it does not seem likely that the conditions of relative naval strength which have obtained during the past ten years will be seriously disturbed because of the changed

* *Evening Standard*, May 15, 1936.

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situation in regard to international agreements. Construction will proceed on more normal lines, without regard to the defunct treaties, but not necessarily in violent conflict with their limitations. After all, it must be remembered that the London Treaty of 1930 only applied in all its parts to Great Britain, the United States and Japan. France and Italy have been free all along to build what they choose in the way of light craft, and the outcome is seen in their output of large destroyers and a greater number of submarines. Italy showed renewed submarine activity during 1936, and may soon become superior in this class of vessel to France, as she already is in the number of her modern cruisers.

Capital Ships.

The rate at which Great Britain has now to replace her obsolete battleships must exceed that visualised in the Washington Treaty of 1922, as the start of the replacement work provided for in the schedule in Chapter II, part 3, of that Treaty is six years overdue. In that schedule it was provided that Great Britain and the United States should each lay down two new battleships in 1931, two in 1932 and one in 1933, these ships to enter service in 1934, 1935 and 1936 respectively. Japan was to lay down one ship in each of the years 1931, 1932 and 1933, and thus the ratio of 5—5—3 would have been preserved. Under the London Treaty of 1930, the start of this replacement construction was deferred until after December 31, 1936. Had the schedule been executed as planned, the first ships of the "Queen Elizabeth" class would have been scrapped in 1935, when 20 years of age, and all the ships of this and the "Royal Sovereign" class by the time they were 24 years of age. By deferring the beginning of replacement, these ships cannot be replaced before they are over 25 years of age, and some 29 years. Meantime, the position of the battle fleet may be compared to that which might have existed if the Grand Fleet in the North Sea in 1914 had contained ships completed in 1885–89—the "Sans Pareil," "Edinburgh," and the "Camperdown" class.

Great Britain laid the keels of her first two ships, the King George V and Prince of Wales, on January 1, 1937, and it was announced by the First Lord on December 16, 1936, that tenders would shortly be invited for the construction of those to be provided for in the 1937 Navy Estimates. The United States provided 4,000,000 dollars in her Navy Appropriation Bill for 1936–37, for the start of her first two ships, the laying down of which was made contingent on one of the treaty Powers laying down similar ships. On January 8, 1937, President Roosevelt announced that he had given orders to proceed with the laying down of the keels of these two ships. In doing so, he expressed regret that the London Naval Conference (1936) was unable to agree to defer the replacement of capital ships, and pointed out that ten battleships were under construction by Britain, France, Italy and Germany.

The attitude of Japan is not so clearly defined. She does not favour the principle of advance information in regard to naval

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programmes, and is not a signatory to the London Naval Treaty, 1936, in Part III of which this principle is subscribed to by Great Britain, the United States and France. The secrecy which she has imposed on the publication of information concerning her programme has led to some exaggerated reports as to what that programme may be. The U.S. Navy Department was reported to have confirmed a statement that Japan would lay down one or more battleships of unprecedented size—ships of 50,000 tons, with an armament of 18-in. guns.* On financial grounds alone, such a course of action appears improbable. The Tokyo correspondent of *The Times*, in a message dated April 12, 1936, said that "there is reason to expect that Japan will conform to the substance of the treaty. Her attitude is entirely negative; she will neither sign nor contravene. With sincerity based on self-interest, her naval authorities declare that she will not begin a building competition." It is understood that her programme provides for four new battleships, to replace the four oldest vessels, Kongo, Kirishima, Haruna and Fuso, which reached the age limit of twenty years in 1935, and that certainly one, and perhaps two, will be laid down in 1937.

In European Navies, the principal development of 1936 was the decision of Germany to begin the construction of a battleship of 35,000 tons at Kiel, to follow the 26,000-ton ships Scharnhorst and Gneisenau, both of which were launched during the year. A second ship of similar tonnage is to be laid down in 1937 at Wilhelmshaven. These vessels may be regarded as corresponding to the French 35,000-ton ships Richelieu and Jean Bart, in the same way that the Scharnhorst and Gneisenau followed the Dunkerque and Strasbourg. The Richelieu was laid down at Brest in October, 1935, and the Jean Bart (authorised by Act of March 30, 1936) at St. Nazaire in January, 1937. Meantime, the construction of the Italian 35,000-ton ships Littorio and Vittorio Veneto, laid down October, 1934, is proceeding slowly.

Battleship construction may best be shown in a tabular statement, as follows:—

	GREAT BRITAIN.		
King George V	Laid down, 1.1.37.	35,000 tons,	14-in. guns.
Prince of Wales	Laid down, 1.1.37.	35,000 tons,	14-in. guns.
3 ships	To be laid down, 1937.	35,000 tons,	—
	UNITED STATES.		
2 ships	Ordered, 1.1.37.	35,000 tons,	16-in. guns.
	JAPAN.		
4 ships	Projected, one or two to be laid down, 1937.	35,000 tons,	(Probably 16-in.)
	FRANCE.		
Dunkerque	Laid down, 1932. Launched, 1935. Completed, 1936.	26,500 tons,	13-in. guns.
Strasbourg	Laid down, 1934. Launched, 1936.	26,500 tons,	13-in. guns.
Richelieu	Laid down, 1935.	35,000 tons,	15-in. guns.
Jean Bart	Laid down, 1937.	35,000 tons,	15-in. guns.

* *Daily Telegraph*, July 22, 1936.

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GERMANY.

Scharnhorst .	. Laid down, 1934.	26,000 tons,	11-in. guns.
Gneisenau .	. Launched, 1936.		
1 ship "F" . .	. Laid down, 1936.	35,000 tons,	14-in. guns.
1 ship . .	. To be laid down, 1937.		

ITALY.

Vittorio Veneto .	Laid down, 1934.	35,000 tons,	15-in. guns.
Littorio . .			

Apparently British policy in battleship construction up to the present has been to provide for a one-Power standard in Europe. The King George V and Prince of Wales will enter service in 1940, and the next three should follow them fairly quickly. By the time these five ships are ready it will be possible for both France and Germany to have four new battleships either in commission or at the trial stage. So far as new construction is concerned, there is no margin similar to that of a 60 per cent. superiority over the next strongest Power in Europe which formed the basis of British battleship construction up to 1914, although for some few years to come such a margin exists in the Nelson, Rodney and Hood, which are the only British capital ships of post-War construction. There are two aspects from which the present building programme has to be regarded, first, the Eurpoean situation ; secondly, the situation in the outer oceans. That it is the former which is the more urgent will be made clear from examination of the foregoing table, which shows that construction began in France in 1932 and in Germany in 1934, in the one case four years, and in the other two years before this country was released from its obligation not to begin any new battleships under the London Naval Treaty. The more pressing need of the position in Europe may also be reflected in the decision, made known authoritatively in July, 1936, to mount 14-in. guns in the King George V and Prince of Wales, notwithstanding the fact that the United States had made known their intention, in the event of the refusal of Japan to accept the 14-in. limitation, to adopt 16-in. guns in her new battleships.

In the interval before the King George V and Prince of Wales become effective, there should be eight ships in commission for Continental Navies more modern than anything possessed by the Royal Navy—the Dunkerque, Strasbourg and Richelieu (France), the Scharnhorst, Gneisenau and a third laid down at Kiel in 1936 (Germany), and the Vittorio Veneto and Littorio (Italy). A cardinal feature of all these ships is their high speed of 30 knots or more. Only the Hood, Renown and Repulse equal them in this respect, and these ships are already from 17 to 21 years old. Moreover, the total of eight excludes the three 10,000-ton, 26-knot, German "pocket battleships" of the Deutschland type, which are superior in speed to all existing British battleships.

CRUISER CONSTRUCTION.

There was a distinct lull in cruiser construction in foreign countries perceptible during 1936, except in Germany. This may have been largely due to the deflection of energy to the construction of

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capital ships or to preparations for this to begin. The number of cruisers actually building for the five principal foreign Powers on January 1, 1937, was twenty-three, two less than a year previously. The number of cruisers completed for these five Powers in 1936 was four, as compared with seven completed during 1935. The number of cruisers which they laid down was three (two by the United States and one by Germany), which compared with ten in 1935 (seven by the United States, one by Japan, and two by Germany). Nor were any large programmes of new cruisers announced.

The British programme of cruiser replacement, which aims at increasing the total number to seventy, of which sixty will be under-age and ten over-age, is a belated measure to overtake deficiencies which have accumulated over a number of years, and thus cannot fairly be considered in relation to the amount of building now going on in other countries. In the years 1920 to 1932, inclusive, for example, there were fewer cruisers completed for Great Britain (twenty-four) than for Japan (twenty-seven). What is now being done is to redress the adverse balance which arose during the years of retrenchment.

The following table summarises the cruiser activity of the six principal Powers during 1936 :—

Great Britain.	United States.	Japan.	France.	Italy.	Germany.
Cruisers Completed During 1936.					
Amphion Apollo Penelope	Quincy	Suzuya	Jean de Vienne	E. di Savoia	—
3	1	1	1	1	—
Cruisers Launched During 1936.					
Aurora Southampton Newcastle Glasgow Birmingham Sheffield	Vincennes Brooklyn Philadelphia Savannah Nashville	Kumano	Georges Leygues	G. Garibaldi. D. d. Abruzzi.	—
6	5	1	1	2	—
Cruisers Continued (but not Launched) during 1936.					
—	Wichita Phœnix Boise Honolulu	Tone Tikuma	Gloire Marseillaise Montcalm	—	"G" "H"
—	4	2	3	—	2
Cruisers Laid Down During 1936.					
Liverpool Manchester Gloucester Belfast Edinburgh	Helena St. Louis	—	—	—	"J"
5	2	—	—	—	1

8-in. Gun Ships.

It is the hope of the British Admiralty to isolate the 8-in. gun cruiser class, though in accordance with the Anglo-German Naval Agreement Germany is allowed her quota and has decided to instal 8-in. guns in cruisers " G " and " H " (laid down in 1935) and " J "

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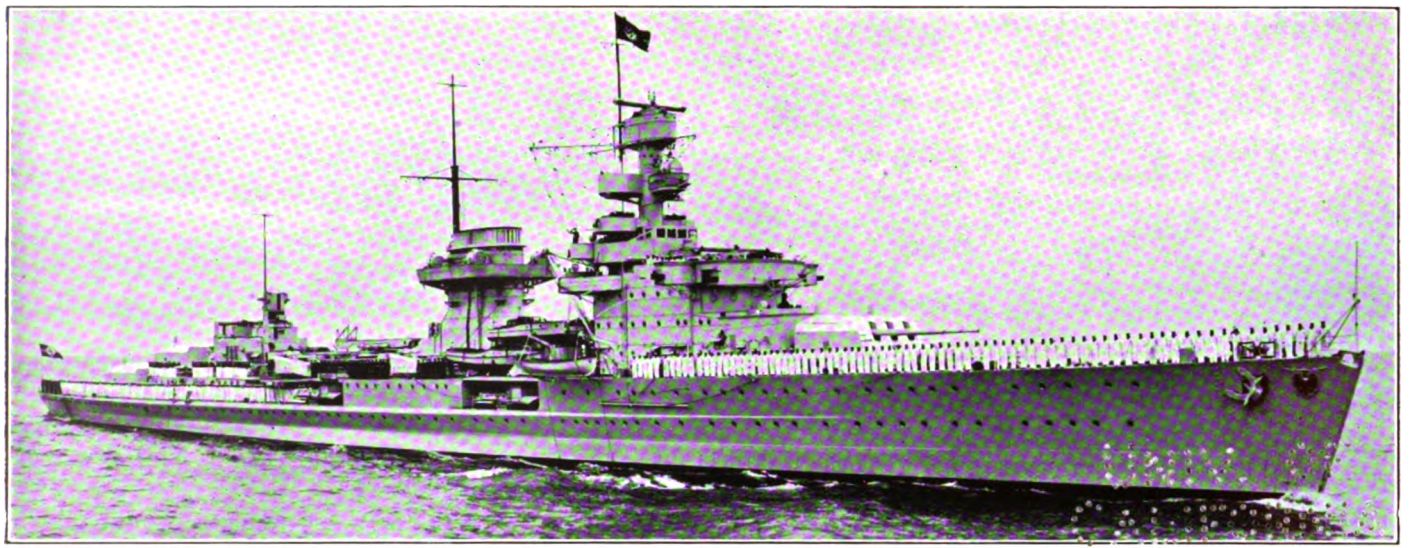

THE GERMAN CRUISER NURNBERG.

Commissioned for Service, 1935.

(By courtesy of the German Navy.)

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(laid down in 1936). All other vessels in the above lists are 6-in. ships except the United States cruisers Quincy and Vincennes. The existing British 8-in. gun cruisers were completed between 1928 and 1931, and will therefore be from ten to seven years old when the German ships are completed.

The output of new cruisers for the principal Powers since the War is shown in the accompanying tabular statement :—

	Great Britain.	U.S.A.	Japan.	France.	Italy.	Germany.
1920	—	—	1	—	—	—
1921	1	—	4	—	—	—
1922	4	—	3	—	—	—
1923	—	6	3	—	—	—
1924	1	3	1	—	—	—
1925	1	1	3	—	—	1
1926	2	—	2	1	—	—
1927	—	—	2	2	—	—
1928	7	—	1	2	—	—
1929	4	1	3	—	2	2
1930	3	4	—	2	—	1
1931	1	3	—	2	4	1
1932	—	2	4	2	6	—
1933	2	1	—	—	1	—
1934	2	4	—	1	—	—
1935	4	—	2	1	3	1
1936	3	1	1	1	1	—
	35	26	30	14	17	6
Building .	11	11	3	4	2	3
Authorised	5	—	—	—	—	—

British Cruiser Strength.

But for the decision of the Government, announced by Sir Samuel Hoare to the House of Commons on December 17, 1936, to invoke Article 21 (the "escalator clause") of the London Naval Treaty to retain five over-age vessels of the "C" class which were scheduled to be scrapped, the British Navy would not have possessed after December 31, 1936, even the minimum of fifty effective cruisers agreed upon in 1930. The present total is fifty-three ships (excluding the Vindictive, in process of conversion into a demilitarised cadet training ship). Four of the fifty-three cruisers belong to the Royal Australian Navy. The total is made up as follows :—

"C" class, completed 1916–1922, 3,895–4,290 tons, five 6-in. guns	13
Adelaide (Australian Navy), 1922, 5,100 tons, nine 6-in. guns	1
"D" class, completed 1918–1922, 4,850 tons, six 6-in. guns	8
"E" class, completed 1926, 7,550–7,580 tons, seven 6-in. guns	2
"Hawkins" class, completed 1918–1925, 9,700–9,996 tons, six or seven 7·5-in. guns	3
"County" class, completed 1928–1930, 10,000 tons, eight 8-in. guns . . .	13
"York" class, completed 1930–1931, 8,400 tons, six 8-in. guns	2
"Leander" class, completed 1933, 7,000 tons, eight 6-in. guns	8
"Arethusa" class, completed 1935, 5,220 tons, six 6-in. guns	3
Total . .	53

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On January 1, 1937, out of this total of fifty-three cruisers, eighteen had passed the age limit of sixteen years from the date of completion agreed upon at the London Naval Conference, 1930, leaving thirty-five within the age limit. Of these thirty-five, again, nine were of War design—vessels laid down during hostilities, but delayed in completion until some years after the Armistice (1922 to 1926), and therefore still nominally within the age limit. The number of cruisers of post-War design was twenty-six, or only half the total number. This proportion of eighteen over-age ships out of a total of fifty-three (or 34 per cent.) will decline during 1937, as only one more ship, H.M.S. Durban, reaches her age limit, and six new cruisers will be passed into service. By the end of the year, therefore, there should be forty cruisers within the age limit (thirty-two of post-War and eight of War design), and nineteen over the age limit.

It will not be until 1941, at the earliest, that the British Navy can be increased to the total of seventy cruisers, of which sixty will be under-age and ten over-age, announced in the White Paper of March 3, 1936, on Defence Policy.

Flotilla Leaders and Destroyers.

Outstanding in a review of flotilla leader and destroyer construction is the German programme. It includes sixteen vessels of 1,625 tons, armed with five 5·5-in. guns and eight torpedo tubes, which were put in hand when Germany denounced the Versailles Treaty two years ago. The first of these large destroyers, the Leberecht Maas, was commissioned at Kiel on January 14, 1937, and is named after the rear-admiral in command of the German torpedo flotilla who was killed in the Heligoland Bight action in August, 1914. In addition to the sixteen of 1,625 tons, six more, of 1,811 tons, were included in the 1936 construction programme. As Germany has only twelve destroyers of 800 tons, apart from this new building, she could add many more vessels to her programme before reaching the proportion of 35 : 100 in relation to the British Navy contemplated in the agreement of June 18, 1935.

The strength of the British Navy in leaders and destroyers on December 31, 1936, amounted to 153 vessels of 189,524 aggregate tons ; 35 per cent. of this would allow Germany 66,333 tons, towards which she has, built and building, thirty-four vessels of 46,466 tons, leaving a margin of nearly 20,000 tons. In addition, Great Britain has thirty-four leaders and destroyers under construction (say, 45,000 tons), of which 35 per cent. would allow Germany another 15,750 tons. In addition to any at present notified, therefore, Germany could build some twenty destroyers of the largest size and still be within the agreement of June, 1935.

But it is important not to overlook, in this connection, the factor of age. To compare only ton for ton may be very misleading. On December 31, 1936, only seventy-two of the British leaders and destroyers were of post-War design and within the age limit for their class. Their aggregate tonnage was 98,379. Add to this the total

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of 45,000 tons building, making a grand total of 143,379 tons, and 35 per cent. of that would give 50,182 tons, towards which Germany has already well in hand 46,466 tons. German post-War construction, that is to say, is already nearly up to 35 per cent. of the British post-War construction in this important class, and when her 1937 programme is announced it will probably exceed this proportion.

In France and Italy destroyer construction is less vigorous than in previous years, when so many large and fast vessels were produced.

Over-Age Destroyers.

During 1936, the last of the British destroyers of the War programmes passed the effective age limit of twelve years adopted at the London Conference of 1930. These were the Shikari and Witch, completed in 1924. The flotilla leaders Broke and Keppel, completed early in 1925, have since followed them on to the over-age list. The position at present is that there are eighty-one leaders and destroyers of War construction, all over-age, and seventy-two of post-War construction; that is, over 50 per cent. of the total number of completed destroyers are obsolete. The United States Navy has a still greater proportion of over-age destroyers, due to the fact that replacement of the large War output did not begin until 1932, after an interval of twelve years, during which no vessels were put in hand. The number since completed is twenty-three, or about 13 per cent. of the total strength. To replace her War-built destroyers, the United States has sixty new destroyers under construction.

Japan has the lowest proportion of obsolete destroyers, the result of her steady output of new vessels. With the exception of one year (1932) she has laid down some new destroyers annually since 1918. Moreover, for over ten years the majority of her new destroyers have been of large type, 1,700 tons, armed with six 5-in. guns. France has the next lowest proportion of obsolete destroyers, and of her present flotillas the outstanding feature is the large vessels up to 2,569 tons, of high speed (37 knots) and a main armament of five 5·4-in. guns. These are not only the largest destroyers in the world, but are over 700 tons above the limit of size adopted for this class in the London Treaty of 1930.

Anxiety concerning the British destroyer position was expressed during the debates on the Navy Estimates in March, 1936. The total then effective (169) compared with 216 on August 4, 1914, and 407 on November 11, 1918, and yet in the War there was always a shortage of destroyers. But in replying for the Government on this point in the House of Lords on March 24, 1936, Lord Hailsham, the Lord Chancellor, stated that "The position with respect to destroyers would before long be better than in any other class of ships."

Since the London Treaty of 1930 was signed, the number of post-War submarines in the French Navy has increased from twenty to eighty-one, and those of Italy from eighteen to seventy-eight. A large German submarine programme has also been begun.

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But the strength of the British Navy in destroyers has remained constant at about 150 vessels, even including those saved from scrapping by the invocation of the "escalator" clause. An illustration of what may happen in an emergency was given to the House of Commons on May 28, 1936, by Admiral of the Fleet Sir Roger Keyes, who said he had recently been in the Mediterranean, "where the British Fleet was being maintained at sufficient strength to fulfil any obligations which it might be called upon to undertake in those waters, but only at the expense of other stations, which were paying off capital ships in order to provide crews for the numerous submarine hunting craft which were considered necessary to meet the very deliberate menace of Italian submarines." *

Retention of Over-Age Tonnage.

The British Government in the spring of 1936 took action for the retention of 40,000 tons of over-age destroyers which would otherwise have been due for scrapping by December 31, 1936, under the London Naval Treaty of 1930. As was explained in the House of Commons by Lord Stanley, Parliamentary Secretary to the Admiralty, Great Britain made a definite reservation in the White Paper accompanying that Treaty that she would have to increase her destroyer tonnage if existing submarine programmes were not reduced. The Government approached their co-signatories of Part III of the Treaty in May, 1936, with an informal proposal to retain the tonnage in question. The United States replied that, since the Treaty provided means for dealing with such a contingency, such means should be followed. The Japanese gave a verbal reply to the effect that if Great Britain proposed informal departures from the Treaty terms, Japan would probably do likewise.

Accordingly, a note was handed to the U.S. and Japanese Ambassadors in London on July 15, 1936, formally invoking Article 21 of the Treaty (the "escalator" clause) to permit the retention of 40,000 tons of destroyers, increasing the British tonnage in this class from 150,000 to 190,000 tons. Next day, Admiral W. H. Standley, acting Secretary of the U.S. Navy, announced that the United States would similarly retain 40,000 tons of her destroyers due for scrapping, and an official notification to this effect was sent to the British Government on August 15. On September 2, the Japanese Government delivered in London a note in reply to that of July 15, stating that they proposed to retain over-age destroyers to a total of 11,059 tons, and over-age submarines to a total of 15,598 tons, a combined total of 26,657. It was understood that Japan represented that she had not sufficient over-age tonnage in destroyers alone to make up the figure of 28,133 tons to which, in accordance with the 5—5—3 ratio, she automatically became entitled by the retention of 40,000 tons each by the United States and Great Britain.

The effect of this decision was to make Japan the superior Power of the three in submarines. She already possessed equality

* *The Times*, May 29, 1936.

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under the London Treaty, each of the three Powers being allowed 52,700 tons of submarines. She was, moreover, already over treaty strength in this type. The official Return of Fleets as on January 1, 1936 (Cmd. 5038), showed her to possess fifty-seven submarines with an aggregate tonnage of 70,234, or 17,534 tons more than the total allowed by treaty ; and she had also ten more building, amounting to 13,700 tons, a combined total of sixty-seven vessels of 83,934 tons. Great Britain and the United States did not have so great a surplus over treaty strength, and included in their totals were larger proportions of obsolete vessels of War design. The figures were :—

	Great Britain.	United States.	Japan.
Submarines under-age . . .	37	39	46
Submarines over-age . . .	14	45	11
Totals . .	51	84	57

Submarine Construction.

Salient features of the submarine construction now in progress are the large programmes of Germany and Italy. Up to the end of 1936, Germany had already launched thirty-six submarines within two years—two of 750 tons, ten of 500 tons, twenty-four of 250 tons. During 1936 Italy had twenty-four submarines in hand—two mine-layers of the " Foca " type, of 656 tons ; two sea-going class vessels of the " Argo " type, of 915 tons ; and twenty coastal vessels, ten of the " Perla " type, and ten of the " Adua " type, of 600 tons. The completion of her present programme, unless older vessels are scrapped, would increase the Italian submarine total to eighty-two, of which seventy-eight would be of post-War types, and would give her numerical equality with France, at present the leading submarine Power. In 1934 Italy had only forty-three completed submarines.

In accordance with the London Naval Treaty, which allowed 52,700 tons each to Great Britain, the United States and Japan, the submarines of the Royal Navy were scaled down to a total of fifty-one vessels, of 52,199 tons, by December 31, 1936. Three submarines, X. 1 (completed in 1925), and L. 18 and L. 19 (completed in 1919), were scrapped.

During the seven years since the London Treaty was signed the submarine strength of France has increased from 52 vessels to 82, and that of Italy from 40 vessels to 65, while Germany has entered the lists. In the Far East, Japan has increased her total from 61 to 66. The British total is approximately the same as in 1930 (51 as against 50), and that of the United States has declined from 122 vessels to 79 by the scrapping of War-built craft.

The large size of Japanese submarines is notable. Her vessels include 31 of 1,000 or more tons displacement. The French have 30 submarines of 1,000 tons or over ; Great Britain, 23 ; the United

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States, 14; and Italy, 9. Germany is not at present building submarines of more than 750 tons. The average surface displacement of all the Japanese submarines is 1,277 tons; that of British submarines, 1,021 tons; that of the French, 953 tons; of the American, 865 tons; and of the Italian, 762 tons. Thus, while France continues to be the leading submarine Power, Japan is much closer to her in this respect that the mere numbers of vessels would indicate.

Aircraft Carriers.

The day of the huge aircraft carrier is passing. The limit of size was represented by the United States' ships Lexington and Saratoga, of 33,000 tons. The Washington Treaty introduced a limit of 27,000 tons. The London Treaty of 1936 brought this down to 23,000 tons. Of the three British carriers building, the Ark Royal (1934 programme) will be of 22,000 tons; the Illustrious and Victorious (1936) are expected to be no larger. Of the three United States' carriers building, the Yorktown and Enterprise, laid down in 1934, and to be completed in 1937, are of 19,900 tons; the Wasp, laid down in 1936 to replace the Langley, will be of 14,700 tons. Of the two Japanese carriers building, the Soryu (launched in 1935) and the Hiryu (laid down in 1936) are of 10,050 tons, and the Chitose (launched in 1936) and Chiyoda (laid down in 1936) are seaplane tenders of about the same tonnage. Neither France nor Italy has an aircraft carrier under construction, but four seaplane tenders are included in the French 1937 programme. The first German aircraft carrier, laid down in 1936, will be of 19,250 tons, and a similar ship is to follow her.

Great Britain will have nine carriers when those in hand are completed, including the Argus, for training purposes, and two more are projected; Japan will have ten, including seaplane carriers; and the United States six. France has two, but Italy only the small Miraglia (4,960 tons). The higher total of Great Britain reflects her needs for oversea operations as compared with the Continental Powers.

G. H. H.

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CHAPTER IV.

The Road to Rearmament.

Dicæopolis : Just make it your own case ; suppose the Spartans
Had manned a boat and stolen a pug puppy
From Seriphos.
Would you not have launched at once
Three hundred galleys ?

Aristophanes, *Acharnians* (Frere).

At the beginning of the year, the question of sanctions on oil was still a burning issue, till a Committee of eighteen appointed on January 23 reported that an embargo enforced by the sanctionist States only could not be effective.* A strong current of opinion was flowing in favour of rearmament and defence, and on March 3 the Government issued a statement † on the subject. British policy, it stated, was based on support of the League, the promotion of collective security, the achievement of a better understanding between nations and an agreement for disarmament. Our example of unilateral disarmament had not succeeded. Conditions in the international field had deteriorated and we must look to our defences. Our armed forces must be maintained at a figure high enough to defend our vital interests and fulfil our obligations of collective security. The whole problem had been carefully studied by a sub-committee of the Committee of Imperial Defence, and it had been decided to appoint a Minister for the Co-ordination of Defence to act as its Deputy Chairman, to co-ordinate its executive action, to make all arrangements for the organisation of industry under conditions of war and through the Principal Supply Officers' Committee to create a reserve of supply. On March 13 the appointment of Sir Thomas Inskip to the new post marked an important stage in the new policy of rearmament and defence.

Its importance was not diminished by the news on March 8 that German troops with flags flying and drums beating had reoccupied the Rhineland zone which had been demilitarised by the Treaty of Versailles. The reasons for this step were presented in a German note.‡ France, by concluding an alliance § with the Soviet against Germany had destroyed the political system of the Locarno Treaty and had created a new situation. On the other hand, Germany was prepared to conclude new agreements on the basis of pacts of

* Text of Report in *The Times*, February 3.

† Statement relating to Defence, Cmd 5107; see also Mr. Eden, February 24, Debate on Foreign Policy.

‡ Memorandum by the German Government, etc., March 7, 1936, Cmd. 5118.

§ May 2, 1935.

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non-aggression for twenty-five years between Germany, France and Belgium, reinforced by an Air Pact between the Western Powers to meet the danger of sudden attack, and non-aggression pacts with the States on Germany's eastern frontier similar to that with Poland. Germany would be willing, too, to re-enter the League. Repercussions followed. On March 12 the representatives of the Locarno Powers other than Germany, that is, Belgium, France, Great Britain and Italy, met in London and came to an immediate conclusion that the reoccupation of the Rhineland constituted a violation of the Treaties of Versailles and Locarno.

On March 19 they issued their pronunciamento. As Germany's action must appear as a threat to European security, they instructed their General Staffs to "enter into contact" with a view to arrangements for the fulfilment of their obligations in case of unprovoked aggression. Germany was invited to submit the question of the Franco-Soviet pact to the Permanent Court at the Hague and to suspend the despatch of troops to the Rhineland. If Germany would accept these proposals, they were prepared to consider the German proposals of March 7 and the revision of the status of the Rhineland. If efforts at conciliation should fail, Great Britain informed France and Belgium that she would consider the steps to be taken and immediately come to their assistance in respect of any measures jointly decided upon, and in return for reciprocal assurances would take all practical measures to secure France and Belgium against unprovoked aggression.*

In Germany at the time an election was pending, which resulted on March 29 in Herr Hitler being returned by 99 per cent. of the poll, and the German reply was not handed to Mr. Eden till April 1. Germany denounced the inequity of the Versailles Treaty which she had endured for seventeen years, and criticised the Franco-Soviet pact as a retrograde step towards the system of entangled alliances which in 1914 had involved Europe in a senseless and terrible war. Germany's proposed plan † asked first for an entire equality of status (that is presumably the termination of all measures derogatory to her sovereignty); secondly, she offered pacts of non-aggression for twenty-five years with France and Belgium, guaranteed by Great Britain and Italy, and supported by a Western Air Pact. She was ready, too, to re-enter the League of Nations in anticipation that the League would consider within a reasonable time the questions of rights of colonial equality and of the separation of the Covenant from its Versailles setting. Great Britain was prepared to give these proposals careful consideration, but a warning note was sounded in a subsequent statement that "His Majesty's Government have not considered and are not considering the handing over of any of the British Colonies and Territories held under Mandate." ‡

The French reply was ready on April 8.§ The strongest guarantee of Western peace had lain in the Locarno Treaty, which the Reich

* Text of Proposals, etc., March 19, 1936. Cmd. 5134.
† Text in *The Times*, April 2.
‡ Mr. Chamberlain in House of Commons, April 7.
§ Text in *The Times*, April 9.

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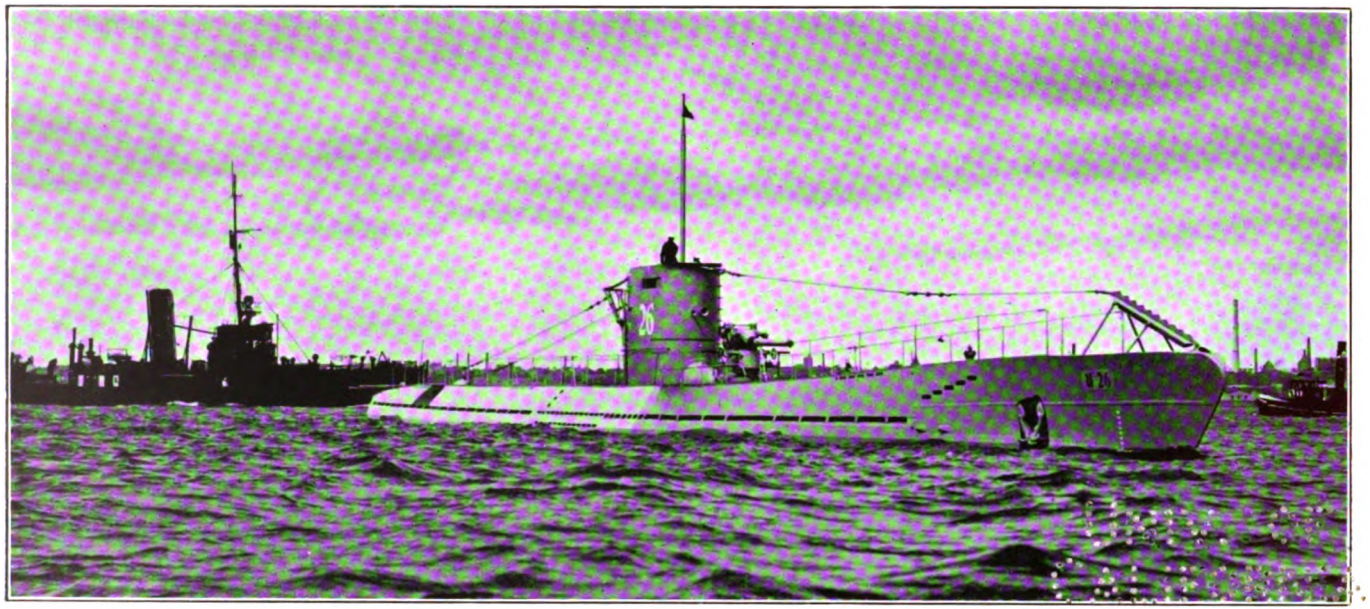

THE GERMAN SUBMARINE U.26.

Commissioned for Service, 1936.

(*By courtesy of the German Navy.*)

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had not hesitated to destroy. The Locarno Powers were ready to consider the question of a new status for the Rhineland, but Germany had refused to submit her claims to the Hague Tribunal. The question at issue was whether Germany was prepared unreservedly to recognise as valid the present territorial and political status of Europe? The French plan went on to formulate elaborate proposals for "peace, universal and enduring," collective security, mutual assistance, disarmament, and economic co-operation. Peace was to be based on a system of mutual assistance within the framework of the League, supervised by a European Commission, operated by a two-thirds majority, controlling forces military, naval and aerial. There could then follow a wide measure of disarmament and a revision of colonial questions on the basis of an equality of economic rights. It may be suggested that the weakness of the French plan lay in its magnificent disregard of the happenings of fifteen years. Nor did it mention where the capital of goodwill sufficient to sustain a paramount Commission exercising sway over the armed forces of Europe was to be found. The immediate issue ended at Geneva on April 8, when the representatives of the Locarno Powers agreed that Great Britain should get in touch with the German Government.

In the case of Abyssinia, the efforts of the Committee of Thirteen had been fruitless. Italy would not agree to a cessation of hostilities, though the effects of economic sanctions had been real enough and her trade with Great Britain had dwindled to a twenty-fifth of its normal value. France was waiting for the results of a General Election, and at the second ballot on May 4 the Front Populaire secured 398 out of 618 seats. By May, the fall of Addis Ababa had become inevitable; the Negus had left the country and the city had become a prey to pillagers, till on May 5 an Italian column marched in and restored order. In Rome, from the Palazzo Venezia, Signor Mussolini announced to a vast crowd that the war was over, and the first act of the Abyssinia drama concluded with a Royal Decree of May 9, announcing the annexation of Abyssinia under the full and entire sovereignty of Italy.*

On May 7 Great Britain handed Germany a note of comment on the latter's proposals. Briefly—did Germany now regard herself as in a position to conclude genuine treaties and was she prepared to recognise the present territorial and political state of Europe? With regard to the offer of non-aggression pacts with States on Germany's eastern frontiers, could these be extended to cover the Soviet Union, Latvia and Estonia? † For these questions Germany had no immediate answer and the negotiations languished for a time.

On the question of sanctions, which was still in suspense, Mr. Eden made an important speech on June 18. The British Government had played their full part in collective action; the purpose for which sanctions had been imposed had not been fulfilled; nor could oil sanctions be made effective by the League alone. These were the hard facts which had to be faced. The position could only be

* Text in *The Times*, May 13.

† Text of British Note in Cmd 5175, Misc. 6 (1936). Correspondence with German Government, March 24–May 6, 1936. Also in *The Times*, May 9.

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restored by military action, and no other Government, and certainly not the British Government, was prepared to take such action. His Majesty's Government had come to the conclusion that sanctions no longer served any purpose of utility, though the League remained the centre of British policy, which would try to achieve its aim of peace by securing the co-operation of Germany.

The League Council met on June 30, and in July Mr. Eden stated to it that he could only repeat with infinite regret that the continuation of sanctions could serve no useful purpose. It was in these circumstances that the Assembly, on July 4, recommended that sanctions be brought to an end, and eleven days later, on July 15, sanctions against Italy ceased. The collapse of the policy of sanctions ushered in the question of a reform of the League, and the various members were invited to send in proposals on this point by September, 1936.

Earlier in the year (April 11) Turkey had proposed to Great Britain and the other signatories of the Treaty of Lausanne (1923) that she should be permitted to fortify the Dardanelles. A conference met, and on July 20 a convention * was signed by which the International Straits Commission was abolished and Turkey was authorised to fortify the Straits with a right of free passage to all merchant vessels in peace and to neutrals in time of war; in the case of men-of-war the Straits shall be open by day in peace time to light surface vessels up to a maximum number of nine and to a total tonnage of 15,000 tons; the Straits shall be closed in peace time to battleships and to cruisers with 11-inch guns, and to submarines and aircraft, and to belligerent naval forces in war time; the limitations of warship tonnage do not, however, apply to Black Sea States, which shall have the right of free exit in time of peace. So ended the Montreux Conference, with the successful revision of an important Treaty, amended by negotiation.

After three years of strained relations Germany and Austria, on July 11, signed a friendly pact, a stroke of policy interpreted by some as a step to a new equilibrium in Central Europe, based on Germany, Austria and Italy.

No reply had come from Germany to the British note of May 7. France was pressing for a meeting of the three Locarno Powers, and on July 18 Great Britain issued an invitation to meet in London, the very day that civil war broke out in Spain. France was anxious to have a more definite pledge of mutual assistance from Great Britain, involving the consideration of all technical arrangements for preparatory measures and their effective execution. The three Powers met accordingly on July 23 and proceeded to propose to Germany and Italy a meeting of the five Locarno Powers to negotiate a new agreement. Mr. Eden, on July 27, in announcing this step stated that the Mediterranean assurances of support associated with the policy of sanctions were being terminated, and Germany and Italy both announced shortly afterwards their acceptance of the invitation.

In Spain, the Parliamentary system had foundered, her ancient

* See page 330

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cathedrals were ablaze, pillage and despoilment, terrorism, murder and strife prevailed everywhere. It was in these circumstances that France, on August 2, made an urgent appeal for a general policy of non-intervention to prevent all Europe being drawn into the horrid vortex of internecine war. Belgium and Great Britain assented at once; Germany, Italy and Portugal less readily, being influenced by a conviction that the fall of the Government and the collapse of Parliament had been engineered by Soviet agents.

It must be regarded as doubly unfortunate that, while the negotiations between the Locarno Powers were resulting in a decrease of tension in the West, relations between Berlin and Moscow were steadily deteriorating, and that on August 24 a German decree was issued announcing an increase from one to two years in the period of military service, with the explanation that it was in no way directed against France, but as a measure of self-defence impelled by the increase in the Russian army and the persistent stream of propaganda issuing from Moscow. France's reply took the form of a plan of intensified rearmament and a scheme of mechanisation at an estimated cost of 186 million pounds,* measures which could not have been very helpful to the negotiations going on at the end of August between Berlin and Paris to discuss the possibility of rebuilding the shattered structure of international trade.

In the Mediterranean Great Britain and Egypt on August 26 signed an alliance of twenty years, recognising British interests in the defence of the Suez Canal and assuring to her in war or emergency the use of Egyptian ports or aerodromes.† Across the border the Government was faced with the necessity of martial law, and twelve battalions in England were under orders (September 9) to sail for Palestine.

The blaze of the Spanish conflict, throwing a lurid glare on European relationships, was not diminished by the stress laid by Herr Hitler at the Nazi rally (September 9–13) on Germany's need for colonies and raw materials and on the danger of the Bolshevist menace. It was in the midst of these difficulties that Great Britain suggested (September 11) that the Five Power Conference might assemble in the latter half of October, and on September 18 Mr. Eden handed the ambassadors an outline of the extent of the proposed conference, covering the points of policy laid down at the conference of July 23, viz. a general settlement of European problems; an avoidance of division into opposing *blocs* and the participation of Germany and Italy. The proposals went on to suggest a new Locarno Treaty, which should arrange for Great Britain receiving guarantees as well as giving them, abolish demilitarised zones and establish a limitation of Air Forces.

The League met that day (September 18), and after long discussions in the Assembly the Abyssinian delegation was recognised as eligible to sit for the session. On the principal subject of discussion, viz. the reform of the Covenant, Mr. Eden stated in an address on September 26 that one objection made to it was that it invited

* *The Times*, September 9.
† Text in *The Times*, August 28.

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signatories to assume obligations which all were not ready to accept; another was that the League stood for an order of things to which some Governments did not consent. Great Britain was in favour of separating the Covenant from the Peace Treaties. She was at present rearming, and would continue to rearm till an international agreement for the limitation of armaments could be reached. The session closed on October 3.

In the latter half of the year Spain was occupying the position in the news headings previously filled by Abyssinia, and on October 7, as General Franco was closing in on Madrid, the text was published in Moscow of a note sent by Russia to the Chairman of the Non-Intervention Committee stating that if violations of the agreement were not immediately discontinued, the Soviet would consider themselves free from the obligations thereof.

A blow to the idea of collective security came from another quarter. King Leopold, King of the Belgians, in his address, October 14, stated that Belgium must follow a policy exclusively and entirely Belgian, placing herself outside any disputes of her neighbours. This step meant that Belgium, while remaining true to her obligations, was adopting a new line of national policy, involving complications in the current Locarno discussions and with definite repercussions on French policy. King Leopold's speech produced a minor diplomatic crisis, raising the question of Belgian foreign policy with new urgency. And yet the reasons were plain enough—Germany had left the League, European antagonisms were as bitter as ever and the Franco-Soviet pact tended to complicate a situation already difficult enough.

The tendency to form groups was growing. In a visit on October 26 of Count Ciano to Berlin, Herr Hitler declared himself ready to recognise the Abyssinian conquest and there was established a "general concurrence of views." Meanwhile the Non-Intervention Committee was steering a troubled course, the Russian and Portuguese delegates surpassing themselves on October 28, when Portugal launched an accusation against the Comintern of being the instigator of the Civil War.

The report of the Royal Commission on the Private Manufacture of and Trading in Arms * was issued at the end of the month. The abolition of the private industry of arms was considered "undesirable," but the Commission was in favour of measures for the international regulation and control of the manufacture and trade in arms. It also recommended that the Government should assume responsibility for the arms industry in the United Kingdom, and should organise the necessary collaboration with private industry, but did not state how this was to be done.

A distinct improvement had taken place in Anglo-Italian relations which found expression in a speech by Signor Mussolini at Milan, when he stressed the fundamental importance of an Anglo-Italian understanding, and that there could be no other solution in the Mediterranean than such an understanding, based on reciprocal

* Cmd. 5292, October 31.

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interests. Disarmament, he said, was one of the illusions which constituted a relic of the shipwreck of Wilsonian ideology.

Mr. Eden in a speech on Foreign Affairs and Government Policy on November 5 hoped for better days for the League. It was not to-day the instrument we should like to see it, but the principles for which it stood were the best yet devised. Defence was necessary, and this country would be second to none in the defence of its legitimate interests. We favoured certain modifications in the Covenant, and a Five Power Conference would help to determine difficulties in the West. In the Mediterranean freedom of communication was a vital interest to the British Commonwealth of nations, but we had no desire to attack any Italian interest there. From the window of the Foreign Office every nation in Europe could be seen rearming, steadily, vigorously or feverishly, and the British programme was based on three main points—to strengthen the authority of the League, to negotiate for a European Settlement and to re-equip our own nation.

The necessity of rearmament was reaffirmed by the Prime Minister, when at the Guildhall on November 9 he pointed out that the whole of Europe was arming and we had to look to our defences. While we had no intention of interfering in the domestic concerns of others, we did not intend to be interfered with, though still ready and anxious to embrace every opportunity of stopping the growth of armaments.*

Another indication of a new crystallisation of interests in Central Europe was discernible when on November 10 the foreign ministers of Austria, Italy and Hungary, meeting in Vienna, affirmed their unanimity of purpose on the question of the Danube basin. This minor but not unimportant conference concluded on November 12, the same day as Mr. Baldwin in the House of Commons in an important speech on the subject of defence stated that the Ministry of Co-ordination was working admirably and the work of the Committee of Imperial Defence, covering an enormous range, had been focussed into a concerted scheme.

Three days later (November 15) came another announcement from Germany repudiating the international control set up by the Treaty of Versailles over her inland waterways, including the Kiel Canal. Germany, in accordance with her claim for equality of status *Gleichberechtigung*), resumed the control of her own rivers and canals and refused to co-operate any longer with the International River Commission.

Meanwhile the Non-Intervention Committee was still labouring in shoal water. Is it too much to say that Great Britain was the only member whose efforts were at all sincere? On November 24 a Bill was brought in making illegal the carriage of arms to Spain by British vessels from any port in the world.†

From the East came another indication of the trend of German policy. In a pact with Japan, signed at Berlin on November 25,

* *The Times*, November 11.

† The export of arms and munitions from the United Kingdom had been forbidden on August 19.

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to remain in force for twenty-five years, the two States agreed to keep one another informed of the activities of the Communist International and to invite other States to adopt defensive measures against the same. To the Englishman sitting under his own fig tree Germany's dislike of Communism may appear exaggerated, but it is possible perhaps that a country that can muster scores of competent Russian linguists for every single one in England knows as much about Russia as ourselves. It must be remembered that the Comintern, seeking the fulfilment of its aims by internal and not by external war, is able to confuse the issues of war and peace, as it can always pose, sincerely enough, as an advocate of peace abroad.

On November 27 the Spanish Government requested the Council of the League to be summoned to examine a situation that threatened its internal peace, the Secretary-General of the League proposing December 7 or 14 as a suitable date. Across the Atlantic the Pan-American Conference met on December 1, when President Roosevelt pointed out that they had not met " to form alliances " and spoke of " continents rent asunder by old hatreds and new fanaticism."

Japan, on December 2, followed Germany in recognising Italy's conquest of Ethiopia. On December 4 M. Delbos, in the Chamber of Deputies, made an important statement to the effect that the forces of France by land, sea and air would be spontaneously and immediately used for the defence of Great Britain (or Belgium) against an unprovoked aggression. Mr. Eden at Bradford on December 14,* referring to his own reciprocal statement at Leamington on November 20, that our arms would be used in the defence of France and Belgium in the case of unprovoked aggression in accordance with our existing obligations, stated that this did not imply an alliance but was a repetition of the assurance given to France and Belgium after the denunciation by Germany in March of the Treaty of Locarno. It did not represent a new departure and Great Britain would desire and cordially welcome German co-operation in coming to a Western agreement.

At Geneva, on December 11, the Council of the League had received the Spanish appeal and the Special Committee of the Assembly were examining the proposals for amending the Covenant, while in Spain, in the fifth month of the Civil War, the struggle was raging as fiercely as ever, with all the sombre fury of the old wars of religion. In an effort to damp down the flames, the British and French ambassadors in Berlin, Lisbon, Moscow and Rome made an urgent appeal on Christmas Eve for measures to prevent the enlistment of their nationals in either of the Spanish armies.

Great Britain and Italy showed their desire for peace by signing, on January 2, at Rome, a declaration stating that freedom of entry and of transit through the Mediterranean was a vital interest to both nations, and disclaiming on the part of both any desire to modify the *status quo*.† On January 9 Great Britain presented a note to Germany, Italy, Portugal and Russia, with a view to ban-

* *The Times*, December 15.
† Text in *Times*, January 4.

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ning the despatch of volunteers and war material to Spain, issuing at the same time a warning that the Foreign Enlistment Act of 1870 was applicable to the struggle in Spain. If the attempt to segregate the war in Spain should succeed, the chief credit will be due to London.

The end of an eventful year leaves Europe, outside Spain, still at peace, but with a dominant note of rearmament sounding everywhere. The collapse of Abyssinia dealt a heavy blow to the idea of collective security, and in conjunction with the attitude of Germany has set in motion a strong current of opinion * calling for a reform of the Covenant, a subject which is actually at present under consideration by a committee of the League. The trend of British thought falls into three categories. One body of opinion, which includes some of the most distinguished experts, diplomatists and international jurists, is in favour of abolishing Article X (preservation of present territorial integrity) and Article XVI (sanctions) and of continuing the League simply as an agency of international conciliation, abandoning any attempt to convert it, in the words of General Smuts, into an "International War Office." It should function as a system of diplomacy and not of law.†

Another distinguished body of opinion, ardent advocates of the League, desire to see the system of sanctions greatly strengthened and made more effective.‡ The weak point in this policy from a naval and military point of view is the difficulty of applying any form of sanctions by a League which has four great Powers, including the United States, outside it. Again, an obligatory system of this type would mean a severe dislocation in the system and employment of our own defence forces, which are organised primarily for the defence of the Commonwealth, and would greatly complicate the issues that they have to face. Thirdly, unless the "sanctionary" Powers could mobilise a force so overwhelming and so immediately available at the critical point as to enforce at once their demands for peace, the system so far from preserving peace would merely increase any tension and tend to convert every war into a world war. A third but much smaller body of opinion proposes that the League should be equipped with an International Force, chiefly of aircraft, ready to coerce any recalcitrant Power. Apart from the very serious obstacles in the way of its administration and command, as soon as such a force, if directed against any great Power, had shot its bolt, it would have to draw its reinforcements and supplies from the "mother" Powers, who would want all their forces and supplies for their own plans of campaign. The defect which characterises most writers on the subject of peace is that they have never made any intensive study of war, and are like charlatans of some wonderful doctrine of health who have never made any real study of

* See *Future of the League of Nations*, Royal Institute of International Affairs, 1936, 3*s*. 6*d*., for interesting discussions on the subject.

† Lord Lothian, *The Times*, April 29, May 5, and at Leeds, June 26; Lord Hardinge, *The Times*, May 1; Sir John Fischer Williams, *The Times*, September 1.

‡ Wickham Steed, *The Times*, June 4; Lord Cecil, *The Times*, June 6; Sir Arthur Salter, *The Times*, June 16.

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disease. The study of a subject like sanctions must involve a careful study of the methods of their actual application, that is a study of war. Diplomacy and defence are both hampered especially in this country by fervent sentimentalists, who find an explosive and aggressive vent in Peace Ballots, Peace Societies and Peace Pledges, but are so ignorant of war as to be antagonistic to recruitment for the defence forces and to military training. The solution of the problem of peace lies not in disarmament but in goodwill. If peace is to be preserved in Europe, some technique must be found for general reconciliation and for the adjustment and revision of outworn Treaties.

The real virtue of the League does not lie in any of its Articles, but in the fact that it represents a sincere effort to express a conception of international co-operation which may, however, require many years, and perhaps many wars too, to reach full maturity. Meanwhile, in a fog of uncertainty, the ship of State has to be steered cautiously. It is no use shouting for a definite policy to carry us full steam ahead towards some unseen and indeterminate goal, when diplomatic soundings and breakers ahead may demand a sudden stop or even a right about turn in the opposite direction. To go careering ahead in pursuance of something called policy may be magnificent but it does not mean peace. That the year is ending with Europe and the Empire at peace is a cardinal fact which diplomacy has to its credit. We have also learnt very painfully that peace is not preserved by unilateral disarmament and that armaments are necessary to ensure a policy of peace, a lesson which may appear something of a truism to the defence forces of the King but which the school of ardent pacifists are just learning to lisp. Some of them still remain wedded pathetically to the idea that wars arise out of armaments, and do not see that they rise like vampires out of the graves of old prejudices and moribund treaties, and nourish themselves on the very societies who in their fervency for peace wake up suddenly to find themselves feeding with their prejudices and antagonisms the very terrors they denounce.

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CHAPTER V.

Fifteen Years of Naval Treaty-Making.

Treaties of naval limitation are a post-war product. Up to 1914 the world accepted naval rivalry as a normal feature of its affairs. Two attempts indeed were made to stay it—in 1859 when Disraeli tried to persuade Louis Napoleon to accept a sort of "naval holiday," and in 1912, when Lord Haldane was sent to Berlin by the Liberal Government then in power with a similar proposition. Neither was successful. The Power approached seems to have regarded the very fact of the approach being made as evidence that this country was reaching the end of its resources, and consequently to have rejected the advances made, confident that it was winning in the race for which it had entered. The confidence proved misplaced.

Up to 1914 this country was vulnerable by sea alone. In a world in which recurrent wars were ever to be expected, it could hope to survive them only if it could rely on victory at sea, to which end it must, and did, maintain a Navy which should be supreme; since the days of Queen Elizabeth it had relied for its defence upon sea power. The industrial revolution of the nineteenth century increased British vulnerability, leaving the country in a position which, commercially and industrially, was commanding, but with a population so vastly increased that the country could no longer feed itself. Invasion by sea was no longer the only way in which the country could be defeated; it was now dependent on the maintenance of its sea communications not only for the means to maintain its industrial supremacy but even for its daily bread. The British Empire, too, had been born of sea power and by sea power alone could it survive attack.

British sea supremacy was challenged from time to time in the nineteenth century by increase in one or other of the European navies—that of France in the later 'fifties, and that of Germany at and after the end of the century. The challenges were met automatically by corresponding increases in the British Navy. The Admiralty never had any difficulty in extracting from a parsimonious House of Commons the money it needed for that purpose; indeed, Governments were more likely to be attacked in Parliament for not making enough naval provision. The popular cry of "We want eight and we won't wait"—referring to "Dreadnought" class battleships of the building programme of 1909—is a case in point.

The challenge to British sea supremacy was not the only instance of naval rivalry. Italy and Austria, though both members of the

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Triple Alliance, were actually jealous rivals, and the competition between them had the effect, eventually, of raising the scale of naval armaments throughout Europe, and so throughout the world. But the chief cause of the "race of armaments" at sea, to which reference is so often made now, was the threat to the security of the British Empire, which was ever seen by this country in the undue growth of any foreign navy, however caused.

In the days of sailing ships, naval rivalry was manifested only in numbers of ships of the line, to the size of which the possibilities of wooden construction set a definite limit. But towards the end of the nineteenth century, with the development of steel shipbuilding, wire-wound guns and "Krupp-cemented" armour plate, there began a growth in the size and weight of armament, and therefore of the cost of individual ships. One or other navy from time to time would produce a battleship of new design—bigger and costlier than the last, of course—which was at once hailed as rendering all earlier men-of-war obsolete. Immediately the special rival of that Navy decided that it must provide at least as many of the new type of ship, or preferably of an even more powerful—and therefore costlier—type, and began to do so. That process is infectious, and affected all other navies, too. Thus arose a new sort of "naval race." In the diplomatic jargon of a later age, naval rivalry could be either "quantitative"—in numbers of ships—or "qualitative"—in size or power of individual ships.

The British Navy never set the pace in the former type of race. Its numbers for many years were calculated on the basis of a "two-Power standard." This meant that the aim of the British Government was to keep the battle fleet up to equality with the two next strongest in the world—or, rather, in Europe; for the U.S. Navy was always excluded from the calculation, and the only other extra-European naval Power, Japan, was an ally from the time her fleet became considerable up to 1922. The British Government automatically met any challenge to the extent of this standard, but it left it to other Powers to be the pace-makers.

It was not so innocent, however, in the matter of qualitative rivalry; on the contrary, in that respect it generally led the race. In the year 1894, few foreign battleships exceeded 12,000 tons, but the British Admiralty were building the "Majestic" class of 14,900 tons. With the exception of certain battleships specially built for service in the Far East, and which therefore had to be kept down to the size which could then pass through the Suez Canal, each class of British battleship designed thereafter was larger than its predecessor. This process reached its culmination in the production by Lord Fisher in 1905 of the Dreadnought, which was not only larger and faster than her predecessors, but also much more heavily armed. This country, that is to say, was the chief instigator of the constant competitive growth in size of ships and of guns, which was responsible, to an even greater extent than the increase in numbers in which we did not lead the way, for the increase in the world's financial burden of naval armaments. Such was the state of affairs up to the outbreak of the war in 1914.

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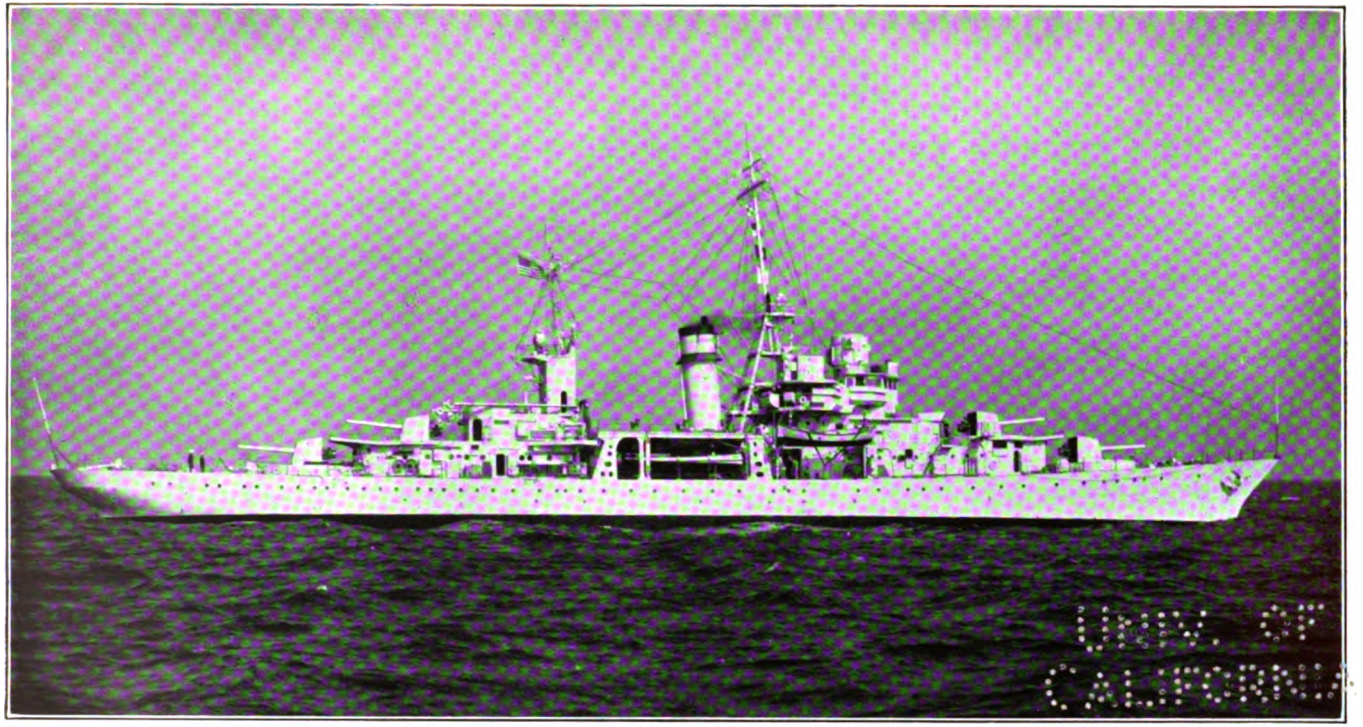

THE UNITED STATES PATROL VESSEL ERIE.

Commissioned for Service, 1936.

(By courtesy of the Navy Department, Washington.)

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After the war, some two years were needed for the world to demobilise itself, and begin to look forward once more. But in 1921 naval rivalry seemed to be dead. There was no German Navy, and by the Versailles Treaty its strength was to remain negligible. No replacements or renewals had been made in the French and Italian Navies, which had in consequence declined. Japan was still an ally and the United States at least was an "Associated Power," though the latter's Navy had never been taken into European calculations even in the days of the two-Power standard. Yet naval competition was not dead, though it was now manifested in a form and locality rather different from before. Both Japan and the United States had adopted enormous building programmes in 1916, during the war, and they were not cancelled after it. Of the British Navy, most of the war-worn ships had been scrapped, a comparatively small force of the latest battleships and battle-cruisers being retained. But in view of the great building programmes in progress at the other side of the world, the British Government announced that it had adopted a one-Power standard, and that four new battleships were to be built. These were to be similar to the Hood except that, following the pre-war precedent, they would be larger and would be of 48,000 tons displacement. Such was the state of affairs when President Harding, on August 11, 1921, invited the British, Japanese, French and Italian Governments to a conference, at which should be discussed not only the limitation of naval armaments but also questions of the Pacific and the Far East. The Conference duly assembled in November of that year, and the Washington Treaties were signed on February 6, 1922.

The Washington Naval Treaty put a stop to naval competition —of both types—by the method of stabilising the battleship strengths of the five Powers at roughly their existing levels; and by limiting both the maximum individual tonnage of, and the maximum calibre of gun which could be mounted in, capital ships, aircraft carriers and cruisers respectively. Total tonnages of battleships were worked out in the ratios of five for the British and American Navies, three for the Japanese, and 1·67 for the French and Italian, and the same ratios applied to aircraft carriers. These ratios were to be maintained by a rigid schedule of scrappings and replacements, designed to replace each capital ship as she reached the age of 20 years. Under this schedule all the signatories would begin to lay down new battleships in 1931; but it was eventually accepted only by Great Britain, America and Japan. France and Italy pledged themselves not to exceed their total allotted tonnage, or the individual restrictions on ships, but would not tie themselves down to definite dates either for scrapping or replacement.

The Americans had originally proposed that smaller classes of ships, *i.e.* cruisers, torpedo craft and submarines, should be similarly limited in the same ratios. To this the British delegation in the Conference made the counter-proposal that submarines should be abolished altogether. The latter, however, was strenuously resisted by France, backed by Japan, and it could not therefore be carried. Whereupon the British delegation declared itself unable to consider

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any limitation of the cruising ships needed by the British Navy to defend its world-wide sea communications against attack by submarines; and in consequence quantitative limitation—the ratios—stopped short at capital ships and aircraft carriers.

The qualitative limits agreed upon were :—

Capital ships—35,000 tons, 16-in. guns.
Aircraft carriers—27,000 tons, 8-in. guns.

Any ship which carried a gun exceeding 8-in. calibre, or any ship other than an aircraft carrier which exceeded 10,000 tons, was to be considered as a capital ship; and since the number and total tonnage of capital ships were definitely limited, this provision in fact imposed the qualitative limits, 10,000 tons and 8-in. guns, upon cruisers.

This was the Washington plan of naval limitation. Its authors, the American Government, have always regarded it with satisfaction, as a model which should be copied and extended in scope. The other signatories have not been so enthusiastic about it, and each has found not a little to object to in it, but they were not in agreement as to which were the most objectionable features. France and Italy both found it derogatory to them, if not insulting, that they should be permanently relegated to a strength little more than half that of Japan. France, too, never admitted the justice of the Italian claim to "parity" between their respective navies. They accepted it, however, under the stress of war-weariness, regarding it no doubt as merely a temporary arrangement which would be superseded in due course by a general and more equitable disarmament convention, to the conclusion of which the world was pledged. The Japanese Government of 1922 accepted the Washington limitation as ensuring —together with the *status quo* clause, which forbade any development of British or American naval bases within reach of Japan—security at sea for their country. The Japanese delegate at Washington declared categorically in open conference that his Government neither desired nor intended to provide a Navy equal to those of the United States or the British Empire. In succeeding years, however, the Japanese attitude changed. There were many of the younger generation, particularly in the fighting services, who knew little of the world outside Japan and cared less; and their party, claiming that under the constitution the Fighting Services were independent of any control by civilian Ministers, came to have an increasing influence in politics. Whereas the Japanese Government of 1922 recognised that Japan, with but 60 per cent. of the battleship strength of Powers half a world away, was absolutely secure in her home waters and in the Western Pacific in which all her major interests lay; that her geographical position ensures to her influence in China such as no other Power can achieve provided she does not destroy it by abuse; later Governments, their hands forced perhaps by the hotheads of the Army and Navy, so antagonised other Powers which have interests in China that they became doubtful of their security. They felt nervous lest antagonism should grow into active interference with Japanese attempts at dominance of China. In short, they came to fear attack by the United States, possibly with

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British assistance, and no longer felt secure under the 60 per cent. Washington ratio ; they decided that they must obtain an increase.

The British Government was also satisfied with the Washington Treaty at first, but after the lapse of a few years two serious objections to it became apparent. The first was that the qualitative limits for cruisers had been fixed much higher than was desirable. When in 1924 the replacement of old cruisers could no longer be deferred, there were several building abroad which were fully up to the limits, 10,000 tons and 8-in. guns. No British cruisers were quite so heavy as that, though the four ships of the " Frobisher " class approached it ; most of those becoming superannuated were much smaller and mounted only 6-in. guns. The new British cruisers to be built would probably have been comparable to those they replaced, *i.e.* 4,000 to 5,000 tons, armed with 6-in. guns, but that a much higher standard had already been set by construction abroad, and the British Navy could hardly be allowed to fall below it. For several years all new British cruisers were of 10,000 tons, mounted 8-in. guns, and cost over £2,000,000 apiece.

The second British objection was that the rigid schedule of scrappings and replacements, together with the very high standards of size, armament, and therefore cost, imposed by the Washington figures, dictated an expenditure on battleship replacement, beginning in 1931, much heavier than any British Government could face with equanimity. The Admiralty would no doubt have preferred to adopt a programme of steady replacement, possibly not quite at the Washington rate, rather than postpone it. They foresaw that to starve the shipbuilding, gun-mounting, and armour-plate firms altogether of work would result in their being incapable of undertaking it if and when replacement eventually became inevitable. They realised that the process of " modernisation " of old ships, besides being very expensive, did not really give full value for its large cost. But despite their views, the Government was unwilling to face the cost of the Washington replacement schedules ; and five years after the Washington Conference it was quite ready to negotiate a new treaty wherein, in the words of President Coolidge, " the principles adopted at Washington could be carried further "—provided that the direction in which they were carried was that of lowering qualitative limits.

In America there was no dissatisfaction with the Washington Treaty except that, quantitatively, it did not go far enough. Great size seems to appeal to the American imagination, and for technical reasons which have never been expounded abroad, American naval officers, in the words of Admiral Pratt, " prefer the 16-inch gun." But there was disappointment that it had not been found possible to secure agreement to quantitative ratios for cruisers, torpedo craft and submarines, as well as for battleships. No difficulties were seen in America to such an extension of the ratio principle—provided always that America were allotted the highest ratio—and there was some surprise, almost resentment, that European Powers found difficulty in agreeing to the modest limit which would have satisfied American views, on the ground that it was an arbitrary

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figure which took no account of the needs of defence for which those Powers found it necessary to provide. These were the considerations which prompted President Coolidge to invite the five signatories of the Washington Treaty to the abortive Conference at Geneva in 1927. It is unnecessary to go into details of what happened at that Conference, since it accomplished nothing, and neither France nor Italy accepted the invitation to attend it. It will suffice to note that the United States bluntly refused to discuss any scaling down of the Washington qualitative limits for ships of any category, and appeared to refuse steadily to recognise any logic in the British attitude on the question of quantitative limitation of cruisers.

The American approach to the question of naval limitation is different from that of European Powers. The United States are less vulnerable to attack by sea than any other country in the world, except perhaps Russia, and since it is the traditional basis of their foreign policy to stand aloof from the quarrels of the Old World, they look on the possibility of a future war from the point of view of a permanent neutral. With the idea, presumably, of preserving both the rights and the continuance of that neutrality, they intend to provide themselves with a Navy equal to the strongest of others. That intention is perfectly legitimate, but it does not necessarily determine the strength of other navies, nor does it give the United States any title to instruct other Powers how they should calculate the naval strength they need. No European Powers base their naval provision upon the strength of the United States Navy. They are unable to share American confidence in being able to remain neutral in a future war, since hard experience has taught them otherwise, and taking the danger of war into consideration, they calculate their naval needs upon what they have to defend. The number of cruising ships needed by the British Navy, for instance, is not affected by the number of cruisers in the American Navy; it depends upon the extent of the sea communications of the British Empire, and the attack to which those communications are liable. It is a pity that this principle was not made more clear at the Washington Conference, for much later misunderstanding would have been saved if it had been.

Article XXI of the Washington Treaty prescribed that a further Conference was to be held in 1930, and when it assembled, all the parties had reasons for desiring a new treaty. The United States, ever enthusiastic for reduction of the world's armaments, still desired to extend the Washington ratios to cover the smaller classes of ships, and if possible to lower the Washington quantitative limits. Japan desired a ratio, particularly in cruisers, greater than three-fifths of American strength. France and Italy too were dissatisfied with their ratios, more for reasons of prestige than from any intention of building more capital ships, and they were fundamentally at variance with one another on the question of "parity" between them. Great Britain desired a lowering of the qualitative limits for both battleships and cruisers, and a postponement of the Washington replacement schedules. And furthermore, the Labour Government of Mr. Ramsay MacDonald then in power, earnestly

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desiring to set an example of limitation of armaments to the general Disarmament Conference which it was hoped would shortly assemble, was determined to conclude some further treaty of naval limitation, even if to do so entailed overriding the views of its naval advisers.

This was the genesis of the London Naval Treaty of 1930. It provided that the replacement of capital ships should be postponed until after the end of 1936—it should be noted that this provision did not apply to France or Italy, since neither of them had accepted any " replacement schedules " but had left themselves a free hand. This shelved the question of any reduction in the qualitative limits, which therefore remained at 35,000 tons and 16-in. guns. Of the capital ships which would have been replaced in 1934–35, Great Britain undertook forthwith to scrap five, the United States three, and Japan one. In the smaller categories, an agreement, in which France and Italy did not join, for quantitative limitation of cruisers, torpedo craft and submarines was concluded between the United States, Japan and the British Empire. Japan was accorded ratios in these classes greater than the 60 per cent. of Washington, and ranging up to equality in tonnage of submarines. In this agreement, cruisers were divided into two categories, those mounting guns exceeding 6-in. calibre and those whose guns did not exceed that figure. The British Empire, while allotted a slightly larger total tonnage of cruisers than the United States, accepted limitation in that and the category of torpedo craft to a figure which the Admiralty, in the absence of any limitation on European Powers, considered altogether inadequate. The period of the Treaty was fixed at six years, and it provided that a new Conference should be called in 1935 to discuss the arrangements that should succeed it. Mr. Ramsay MacDonald later explained that the drastic restrictions on the British Navy accepted under this Treaty were undertaken for that comparatively short period only, in view of the tranquillity of the international situation then obtaining, and in the hope that before the Treaty expired a general Disarmament Convention, encouraged by this example, would have been concluded. (The hope, of course, proved vain; but it was not until the result of the 1936 Naval Conference proved it so that the quantitative cruiser and torpedo-craft restrictions were eventually abrogated, on the motion of the British Government, by the application of the " escalator clause.") It remains only to record that France and Italy never ratified even that part of the Treaty which they signed, though, as is described below, they later specifically accepted the section of it which renounces " unrestricted submarine warfare." The 1930 Treaty remained a three-Power Treaty, between the United States, Japan and the British Empire only.

Many things happened between 1930 and 1935 to affect the prospects of the cause of naval limitation. The Disarmament Conference assembled, discussed, and adjourned *sine die* without result. Germany repudiated the naval restrictions of Versailles, and began to rebuild her Navy untrammelled by any foreign control. She did, however, conclude the naval agreement of 1935 with this

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country, voluntarily accepting a quantitative limit of 35 per cent. of British strength in each category of warships. Despite that limitation, Germany's action hardened French determination to have done with the Washington ratios, and that determination was fully shared by Italy. Japan embarked on her Manchurian adventure and left the League of Nations, an action which was so loudly denounced in America and elsewhere as to increase Japanese fear of armed intervention by America, and possibly Great Britain. Japan, too, was determined to be free of the Washington Treaty ratios, and in December, 1934, she gave the two years' notice necessary to terminate the Washington Treaty at the end of December, 1936. This action, under Article XXIII of the Washington Treaty, rendered obligatory the calling in 1935 of a Conference of the signatory Powers.

Preparation for a Conference had already begun, since the 1930 Treaty had also provided for a Conference in 1935. Profiting by the lesson of 1927, the British Government began to prepare the ground some time beforehand by preliminary conversations with each of the Powers. Thus Great Britain, the convening Power of the Conference, was well informed beforehand of the attitude of each of the parties, and was able to make a forecast of those matters upon which some agreement was possible and avoid wasting the time of the Conference itself over those upon which it was not. The respective standpoints of the conferring Powers were as follows :—

The United States desired to continue the Washington Treaty—which they regarded as the pattern of what such should be—and to extend it by establishing ratios of total tonnage for all categories of warships, if possible at a level some 20 per cent. lower than those of the earlier treaties. But they objected to a scaling down of the qualitative limits, being particularly devoted to the 35,000-ton, 16-in. gun battleship and the 10,000-ton, 8-in. gun cruiser ; and it was a cardinal point that the United States should be allotted the highest quantitative ratio, not less than 100 : 60 compared with Japan.

For reasons already explained, France was determined to be free of ratios. She desired drastic scaling down of qualitative limits, both for capital ships and cruisers, but disliked the multiplication of " categories " below that of cruiser, brought about by the arbitrary distinction—in the 1930 Treaty—between cruisers and torpedo craft. She would not agree in any circumstances to the abolition of submarines, or even to reduction of their size. She was in favour, in order to avoid suspicion and mystery, of full interchange of information between signatories respecting building programmes, though not ready to bind herself to definite programmes for any prolonged period ahead.

Except that she professed herself sympathetic to the abolition or drastic limitation of submarines, the attitude of Italy was practically identical with that of France.

Japan's attitude to the Conference was difficult for an Occidental to understand. She gave the impression of having regarded the earlier Treaties as matters between herself and the United States

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alone—a view held, it may be noted, to a considerable extent in America also—and in making proposals for a new treaty to have ignored altogether how they would affect European Powers. Thus, like France and Italy, she was determined to have no more of ratios, on the ground that they were incompatible with national self-respect. But not content with the proposal to abolish them, she proposed in addition the adoption of the "common upper limit"—by which she meant a definite limit of total tonnage, up to which both she and the United States should be free to build, and which should be fixed as low as possible, at a level preferably below her own existing tonnage. She did not seem to consider how this proposal would appear to the European parties to the Conference, nor how it could be harmonised with their well-known views. She proposed the abolition, or at least the drastic limitation, of all "offensive weapons," in which category she included capital ships, 8-in. gun cruisers, and aircraft carriers; but she classed submarines as solely "defensive," and supported the French objection to any limitation of them.

Having ascertained beforehand the views of the other parties, the British proposals were framed on the greatest common measure of possible agreement. The British Government would have been content to perpetuate the Washington ratios in battleships and aircraft carriers, but not the 1930 London ratios in cruisers and torpedo craft. Since, however, it was well known that three out of the five parties were determined to abolish ratios, the British proposal was to abandon quantitative limitation altogether, but as far as possible to avoid quantitative competition by each Power announcing, for a term of years ahead, the maximum amount of new construction which she undertook not to exceed. They proposed to scale down qualitative limits to 25,000 tons with 12-in. guns for battleships, 7,000 tons with 6-in. guns for cruisers, and 250 tons for submarines. In order, in the absence of any agreed limit on the number of battleships each Power might possess, to make effective the qualitative limits for cruisers they proposed an agreement not to build any ships of tonnage between the upper cruiser limit and a low limit for battleships to be fixed several thousand tons higher. This proposal was known as the "non-construction zone."

It was evident there was much material for an agreement, which without detriment to the security of any Power should save them all much useless expenditure. All parties to the Conference professed attachment to the principle of limitation of armaments, disclaiming for themselves any intention of starting a new race. "Ratios," or indeed any form of quantitative limitation which they embodied, were evidently dead and not to be revived; but all parties were agreed on the desirability of qualitative limitation, differing only on the precise figures, or categories, to be adopted. There was no difference of opinion as to the desirability of interchange of information respecting intended building programmes, with the object of avoiding suspicion and panic building, though there was disagreement as to the period ahead that should be covered. Evidently, given a spirit of give and take over details, there was a good prospect

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of concluding a treaty which should be useful, and free from the defects of its predecessors.

The Conference assembled in London on December 9, 1935, and it at once became evident that there was to be no spirit of give and take in the Japanese attitude. According to Press messages from Tokyo, there were two schools of thought in the Japanese Government. The more moderate, represented by the Foreign Office, considered that, provided the ratios disappeared, concessions could be made over details of the remaining proposals, for qualitative limitation, etc. The more stiff-necked, represented by the Admiralty, probably under the influence of the arrogant and bellicose party so strongly represented in the Japanese fighting services, thought to get all they demanded by the threat of withdrawal, since they calculated that the other parties would be reluctant to face the complete breakdown of the Conference which they were confident that Japanese withdrawal would cause. The latter prevailed, despite the discovery that the Conference had no intention of being dominated by the Japanese and would continue its work whether they stayed or left. Many full sittings were devoted exclusively to exposition of the Japanese proposals, including the "common upper limit," and it was clear that there was much in their proposals for qualitative limitation upon which general agreement might be reached. That, however, was not enough for the Japanese delegation; and when, on their insisting on a decision being taken on the "common upper limit," it was unanimously rejected by the other delegations, acting on instructions from Tokyo they withdrew from the Conference.

Thereafter, steady progress was made. Little time was needed to reach agreement over qualitative limits, since the maximum modifications to its own proposals that each Power was willing to accept were already known from the preliminary conversations. Some little time was occupied by the vain efforts of the French and Italian delegations, somewhat sceptical perhaps of the strength of the previous British efforts in the same direction, to induce American agreement to maxima for battleships and cruisers lower than those of Washington. The only American concession, in the matter of battleships, was the acceptance of 14 inches as the limit of gun calibre, provided it was accepted by all the Washington signatories (*i.e.* Japan as well as the Conference Powers) before April, 1937; failing that acceptance, the limit was to remain at 16 inches. In the matter of cruiser limits, the utmost American concession was a "building holiday" up to 1942 in 8-in. gun cruisers, and 6-in. gun cruisers exceeding 8,000 tons; and this, too, was conditional, in that it might be cancelled if any Power, signatory or not, were to build more small cruisers than the United States—or any other signatory—considered appropriate. The "non-construction zone" was agreed upon as 10,000 to 17,500 tons, and for the same reason it was agreed that capital ships should not mount guns smaller than 10-in. calibre. Limits for aircraft carriers, more moderate than those of Washington, were fixed at 23,000 tons and 6-in. guns. And, finally, the British proposals for a declaration of

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THE UNITED STATES CRUISER QUINCY.

Commissioned for Service, 1936.

(*By courtesy of the Navy Department, Washington.*)

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maximum building programmes was combined with the French proposals for *pré-avis* into a comprehensive scheme for the annual interchange, between signatories, of full information regarding the new construction intended for the next year and accomplished during the last.

There were several " safeguarding clauses "—a feature in which the 1930 Treaty had been notably deficient—whereby the qualitative restrictions accepted by the signatories could be relaxed in the events of war, of non-signatory Powers building ships which do not conform to them, or of any unforeseen change in the international situation which altered the basis upon which the Treaty was framed. But in any case the provisions for interchange of information were to remain in force, and any relaxation of restrictions was in every case to be preceded by consultation between the signatories. The period of the Treaty was fixed as up to the end of 1942, and a further conference was to be convened before it expired.

While the Conference was in progress it was clearly realised that, even before the withdrawal of Japan, it was seriously incomplete. In 1921, the Washington Powers represented all the considerable navies of the world. But in 1935, the German Navy was again becoming a factor in world affairs, and though it was limited quantitatively by the Anglo-German Agreement, no treaty of qualitative naval limitation could be a reality unless it was accepted by Germany as well as the other naval Powers. The simple method of dealing with that difficulty would have been for Germany to take part in the Conference; but that was impracticable. French public opinion would not have tolerated acquiescence in the flagrant breach of the Versailles Treaty which German rearmament constituted; and on the other hand, Germany would enter no conference in which she was not accepted by the other parties on terms of full equality. But it was no less urgent to devise a means whereby the Treaty, when concluded, should be applicable to Germany; it was even more urgent after the defection of Japan. A means of surmounting the difficulty acceptable to all parties was found in the negotiation of a separate bi-lateral agreement between Great Britain and Germany in terms similar to those of the Treaty itself. Conversations to this end began during the Conference, and are still in progress at the time of writing.

The proposal of qualitative restrictions to Germany inevitably raised the question of the Russian Navy, since Germany could not be expected to bind herself to limits from which her chief naval rival in the Baltic was free. Consequently, the British Government also started conversations with Russia for a similar bi-lateral agreement. They were, it is understood, somewhat delayed by technical difficulties, but they too are still progressing.

The Treaty was signed on March 25, 1936, by representatives of the United States, France, and the nations of the British Commonwealth with the exception of the Irish Free State and the Union of South Africa. The two latter explained that, since they neither possessed naval forces nor intended to acquire them, it would be incongruous for them to enter into a treaty of technical naval

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restriction. The other member of the Conference not signing the Treaty was Italy, whose signature was withheld on account of the differences between Italy and the League Powers arising out of the Abyssinian War. Signor Grandi, the Italian delegate, explained that his country could enter into no friendly treaty of naval limitation with Powers who were maintaining a naval concentration in the Mediterranean which was obviously directed against her; but he hinted that Italy's signature might be forthcoming at a later date if the tension to which he referred were relaxed—an attitude which seemed the more reasonable since the Italian delegation throughout the Conference had co-operated helpfully in framing details of the Treaty.

The Treaty was ratified by the United States on May 18, 1936, but it has not yet been ratified by France or the British Empire, and is thus not yet in force even between the three original signatories. The reason for the delay lies partly in the slow progress that has been made with the conclusion of the string of bi-lateral pacts, and partly in the uncertainty that prevails over the intentions of Italy and Japan. The former have now been multiplied much beyond the Anglo-German and Anglo-Russian pacts first contemplated. Obviously the other Baltic naval Powers, even if their naval strength was of small moment, had to be brought into any agreement for qualitative limitation before Germany and Russia could be expected to accept it; but little difficulty is expected there. The same considerations apply to the Black Sea, which adds Turkey to the tale of those to be brought into the fold, with the more force since the new Straits Convention has increased the weight of Turkish influence in the Mediterranean. It seems unlikely that there will be any opposition or obstruction from that quarter either, but the multiplication of parties to the conversations inevitably causes delay.

The second cause of delay is more serious. The tension in the Mediterranean between Italy and the League Powers has indeed relaxed, and the Anglo-Italian Declaration of January 2, 1937, by which both Powers disclaimed any ground for dispute between them, seemed to smooth the way for Italy's acceptance of the Treaty she had helped to frame. So far, however, complete acceptance has not been forthcoming, though on January 16, 1937, she announced that she would accept the 14-inch gun limit for capital ships, provided it was accepted by all important naval Powers. This again means Japan, since the other Powers are but waiting on the action of this country.

So far as an outsider can judge, it would seem that if Japan were to give an undertaking that she would not build capital ships exceeding the Treaty limits, the Treaty would at once be ratified by Great Britain and France—thus coming into force between the original signatories—and the string of bi-lateral pacts would be concluded without more delay. For that action by Japan would at once make effective the 14-in. limit for capital ships' guns, and any Japanese departure from the other qualitative limits, *e.g.* for cruisers, could be met by the application of the escape clauses. It would no

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doubt be hoped that she would equally accept the other restrictions, which are of just as great value to Japan as to any other Power, provided they apply to all. Yet the most important factor in the elimination of futile competition in size, and therefore expenditure, is the restriction of capital ships, and it might well be considered worth while to conclude a treaty which effected that alone—together with interchange of information between signatories—rather than achieve no treaty at all through holding out for more. But it would be almost futile, in the absence of such an undertaking by Japan, for Great Britain and France to ratify the Treaty, since all its provisions, except for exchange of information, would be nugatory. Failing ratification of the main Treaty, the projects for the parallel bi-lateral pacts also fall to the ground.

Thus the question whether the world is to take any effective step towards the elimination of the futile and costly "battle of the building yards," with which we were familiar before the war, lies at the time of writing in the hands of the Japanese Government. If they take no step, on them will be the responsibility for missing an opportunity for improvement in world conditions which may never recur. That consideration would probably have weighed with many of the more moderate Japanese statesmen who have been in power in recent years. Whether it will have any weight with the Government which came into power early in 1937 seems much more doubtful.

One tangible result has so far been achieved by fifteen years of naval treaty-making—an extension of the undertaking to refrain from "unrestricted submarine warfare." That undertaking was contained first in the Washington Treaty No. 2 of 1922—an instrument which never came into force through lack of ratification. It was repeated in the London Naval Treaty of 1930, and by that instrument is binding in perpetuity on the United States, Japan and the British Empire. But since France and Italy did not ratify the 1930 Treaty, it was not binding upon them. During 1936, however, France and Italy specifically accepted the undertaking, in a protocol by which Great Britain was requested to invite the adherence of all other naval Powers. The invitation was duly issued, and was accepted almost immediately by Germany and later by Russia. If the naval conferences with which we have become so familiar have accomplished nothing else, they have at least induced the principal naval Powers of the world to abjure the use—by ships, at least—of methods which were stigmatised in the last war as barbaric.

H. G. T.

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CHAPTER VI.

The New German Navy.

Sea power has played an important but not always advantageous role in the history of Germany. An extended coastline, good harbours, large rivers, giving easy access to the interior, and a flourishing trade are generally very valuable assets for a nation, but may become a danger if they are not protected and defended adequately. German coastwise and foreign trade prospered as long as the Hanseatic League ruled the Baltic and the North Sea. When, in the sixteenth century, Germany was drawn into the vortex of Habsburg world politics the League declined, and the last remnants of its power and its shipping were destroyed by the terrible Thirty Years War. For centuries Germany was the battle-ground of all the armies of Europe; she lost a great part of her seaboard and was invaded from the North by Danes, Swedes or Russians, whoever happened to dominate the Baltic. With great difficulty Brandenburg/Prussia recovered the provinces on the sea, tried to restore sea power, and even founded colonies. This hopeful beginning was not crowned with lasting success, however, commitments on the Continent being too heavy on account of almost continuous French invasions. During the Seven Years War and the Napoleonic Wars Prussia allied herself to Great Britain, thus providing for some protection of her growing maritime interests. This could not prevent her merchant navy as well as those of the other German States bordering on the sea from suffering heavily during these turbulent times. It was not until the middle of the 19th century that they again grew to a size proportionate to the national needs. The want of a Navy was sorely felt during the Wars of Unification, 1864 till 1871. An Imperial Navy was formed out of Prussian ships. It grew slowly until at the beginning of this century it was energetically increased.

In the Great War the young Navy fought in a manner worthy of its great adversary. It kept the trade routes of the Baltic open and successfully protected the German coasts. It could not shake off the blockade, which broke German resistance at last. The High Seas Fleet sank in the grey waters of Scapa Flow, the Merchant Fleet had to be given up, the most important fortifications had to be destroyed, the great rivers were internationalised, a seaboard of nearly 1,000 miles again lay open to every enemy.

The situation resembled the worst times of German history. But things were changed; the nation understood the sea better. Without much help from a weak Government the mercantile fleet was built up again. The case of the Navy was more difficult. It

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had disarmed, honestly and thoroughly. It may be mentioned that, in spite of all that certain foreign papers kept on saying, the German Navy had not one submarine till June, 1935. The Treaty of Versailles left the torso of a fleet only, with six small "battleships" as main force and without submarines and aircraft. The clauses of the Treaty were carried out so fully that in the winter of 1922–23 minesweepers were armed with one cutlass and the private pistol of the captain. Even the searchlight was removed, being registered as a "weapon."

By the end of 1932 only one of the old battleships, obsolete already in 1914, had been replaced, and two more armoured ships were building. Five light cruisers, 12 destroyers, and a few auxiliary and training vessels were completed. Lack of funds and of men made it impossible to keep in service the few ships allowed by the Treaty. Only four ships of the line and five cruisers were in commission.

This Navy was absolutely unequal to the task of protecting German shipping and trade. Its prospects seemed hopeless to its officers but for the thought that it might form the nucleus for the fleet necessary for Germany. Therefore everything humanly possible was done to keep the spirits of officers and men and their fighting qualities on the highest level. Even part of the meagre store of reserve ammunition conceded by the Treaty was expended for target practice under battle conditions. The "Chiefs of the Admiralty," Admirals Behncke, Zenker, and Raeder, succeeded in creating a hard-working, homogeneous Navy, proud of its tradition and fully alive to the precarious situation of a weak, party-ridden nation, easily cut off from the open sea and surrounded by increasingly well-armed neighbours.

THE BASIS OF RECONSTRUCTION.

Three factors are of outstanding importance in the creation of the new German Navy :—

The restoration of military equality.
The naval agreement with Great Britain.
The reintroduction of compulsory service.

The first means that the development of the Navy is no more subject to limitations imposed upon it against the will of the Government. Within the clauses of the voluntary agreement mentioned above, Germany is free in the choice of the types to be built, their displacement, the calibre of their guns, etc. She can again put in order the defensive protection of her coasts, and she is no more compelled to man her ships with volunteers serving under terms not congenial to the national character.

The agreement with Great Britain fixes the size of the Navy, and shows better than words could do the firm will of the Leader of the Reich not to compete with Great Britain in naval armament.

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It is valid as long as the general equilibrium of naval armaments is not upset "by any abnormal and exceptional construction by other Powers."

Compulsory service solves the question of sufficient reserves for manning auxiliary vessels, coast and anti-aircraft batteries.

THE BUILDING PROGRAMME.

The Naval Agreement of June, 1935,* provides for a strength of the German Navy in the proportion of 35 per cent. of the aggregate naval strength of the members of the British Commonwealth of Nations. While the Washington and London Treaties were in force this meant the following size of both navies :—

	Great Britain.	Germany.
	tons.	tons.
Battleships	525,000	183,750
Heavy cruisers	146,800	51,380
Light cruisers	192,200	67,270
Aircraft carriers	135,000	47,250
Destroyers	150,000	52,500
Submarines	52,700	18,445 (23,715)
Total	1,210,700	420,595

There is one exception to the 35 : 100 ratio in the case of submarines. Germany has the right to possess a tonnage equal to the British tonnage in this class. She undertakes, however, not to build more than 45 per cent. without giving notice to the British Government and discussing the matter "in a friendly manner." The grand total is not affected by this clause. Any increase of the submarine tonnage above 35 per cent. is, therefore, to be balanced by an equal reduction in another category. Small adjustments are provided in order to enable Germany to utilise her tonnage to the full.

In 1936, Supreme Command decided for a programme of construction which is intended to create a fleet of the following composition without about six years (existing ships included) :—

5 battleships.
3 armoured ships (existing).
14 cruisers.
2 aircraft carriers.
40 destroyers and torpedo-boats.
Submarines of a total tonnage of about 22,000.

Battleships.

Two ships of 26,000 tons each were launched at Wilhelmshaven on October 3, 1936, and at Kiel on December 8. They received the historic names of Scharnhorst and Gneisenau, commemorating the

* For Text, see "Brassey's Naval Annual, 1936," p. 311.

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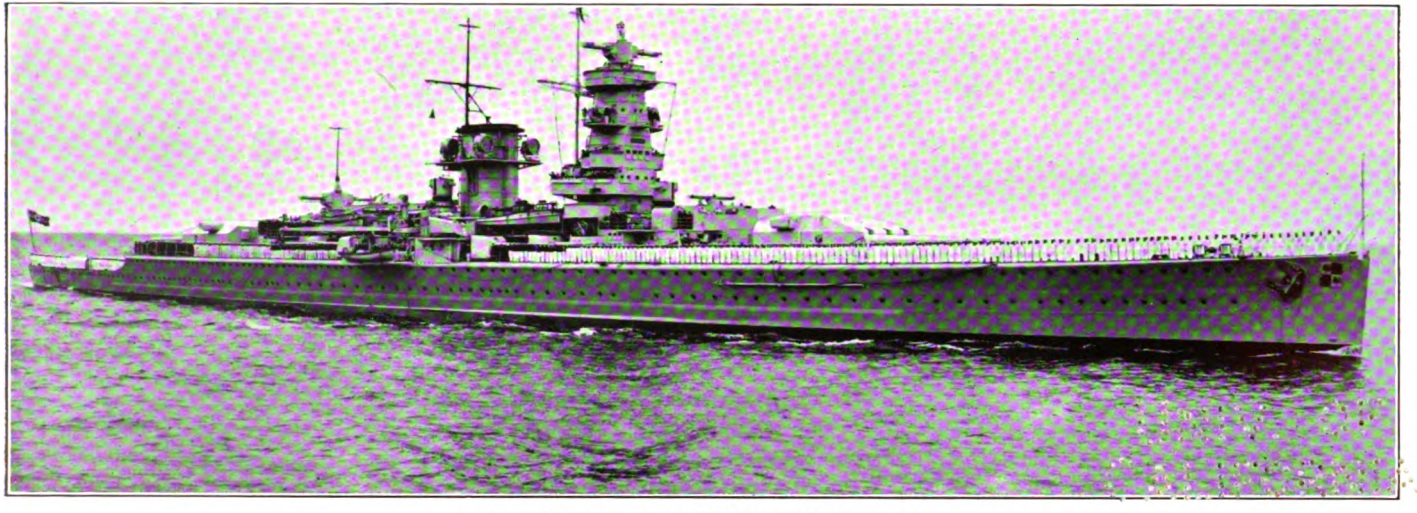

THE GERMAN BATTLESHIP GRAF SPEE.

Commissioned for Service, 1936.

(By courtesy of the German Navy.)

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fight for freedom of 1813–15 as well as the success and heroic end of von Spee's squadron in 1914.

The dimensions of these ships are a length of 226 metres (742 ft.), a beam of 30 metres (98·4 ft.) and a draught of 7·5 metres (24·6 ft.). Their main armament will consist of nine 11-inch guns and twelve 5·9-inch guns. Other details are not yet published. The displacement, and especially the calibre of the big guns, are very modest for modern battleships.

Battleship F (to replace the obsolete Hannover) is building. She will displace 35,000 tons, but no further details are available. It is to be expected that battleships G and H will be of the same size.

Cruisers.

Six light cruisers of a total tonnage of 35,400 were built after the war. Three heavy cruisers (G to replace the obsolete Hamburg, H for the Berlin and J) are under construction, with a main armament of eight 8-inch guns. So far, no details are known of the five other cruisers to be completed by 1942.

Aircraft Carriers.

There is one building and one projected, but no details are available with the exception of a displacement of 19,250 tons.

Destroyers.

The 800-ton type allowed by the Treaty is very weak compared with the average destroyer of the other Powers, to say nothing of certain super-destroyers. The 200-ton torpedo-boats of the Treaty proved an impossible type for a modern Navy and were not built. Consequently the German Navy is in need of a great many destroyers. Z 1–16 (1,625 tons, five 5-inch guns, two quadruple tubes) are nearing completion, Z 17–22 of 1,811 tons were laid down in 1936, as well as twelve torpedo-boats (T 1–12) of 600 tons.

Submarines.

There are ready for service or nearly finished :—

U 1–24 of 250 tons, armed with one machine gun and three bow tubes ;

U 25 and 26 of 712 tons, armed with one 4-inch gun, four bow and two stern tubes ; and

U 27–36 of 500 tons, armed with one 3·4-inch gun, four bow and one stern tube.

This gives a total of 12,424 tons, and leaves about 10,000 tons of which the distribution has not yet been announced.

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Minesweeping Vessels.

Ten *Flottenbegleiter* (Fleet escort vessels), F 1–10, a new type of fast minesweeper, are ready for service. Their displacement is 600 tons; they are armed with two 4-in. guns and four 1·45-in. guns and carry no torpedo tubes.

M 1–12, ordinary minesweepers of 600 tons, are on the stocks. From their distinguishing letter it may be inferred that they are meant to replace the old M-boats which proved very useful during and after the war.

M.L.s R 21–24 are under construction. Some of the preceding minesweeping motor launches are equipped with Voith-Schneider propulsion, consisting of two horizontal discs with vertical blades. There is no rudder, and the vessels manœuvre astonishingly well. They are literally able to go sideways, thus solving a problem that has faced many a midshipman when bringing a launch alongside.

Coastal Motor Boats and Auxiliaries.

Two C.M.B.s are building, bringing the total number to 17. They are armed with two 19·7-in. tubes and one machine gun. The submarine tender Saar (2,750 tons), the C.M.B. tender Tsingtau (2,000 tons), the gunnery training vessel Brummer (2,410 tons), the graceful scout Grille (2,560 tons), and some smaller craft were commissioned within the last two years in order to provide the growing fleet with the necessary auxiliary vessels. The obsolete battleship Hessen, a veteran of Jutland, is being converted into a distant-controlled target ship.

The number of new vessels and the resulting increase in fighting power is already considerable. By the addition of submarines, aircraft, auxiliary vessels, and in a near future destroyers, the crippled fleet of Versailles status is transformed into a well-balanced modern fleet. It should not be overlooked, however, that not a single big gun has been added so far, and that the main body of the fleet still consists of no more than the three 10,000-ton ships of the "Deutschland" class. Germany therefore ranks in battleship strength far behind the five leading navies, and even behind some of the smaller ones.

THE ORGANISATION OF THE NAVY.

The Navy forms part of Germany's Armed Forces and ranks with the Army and the Air Force. The Leader of the Reich is Supreme Commander; the Minister of War, Field-Marshal von Blomberg, is Commander-in-Chief of the Armed Forces. His duties are military as well as administrative. The same is the case with the C.s-in-C. of the three fighting services. The Navy has been commanded by General-Admiral Dr.h.c. Raeder since 1928. General-Admiral is a recently created rank, between Admiral and Admiral of the Fleet.

The *Oberkommando der Kriegsmarine* (Supreme Command of the Navy, *i.e.* the Admiralty) at Berlin is divided into the personal

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staff of the C.-in-C., five big departments, and several smaller independent sections. The chief departments are :—

The Naval Staff (*Marinekommandoamt*). Its domain is: Plans, Operations, Intelligence and Training.

The General Naval Department (*Allgemeines Marineamt*). It provides for the material readiness of the Navy and is responsible for survey and for keeping in touch with the merchant navy and industry.

The Naval Administrative Department (*Marineverwaltungsamt*). In its sphere are pay, provisions, clothing, and housing. It controls the administrative branches at Kiel and Wilhelmshaven.

The Naval Ordnance Department (*Marinewaffenamt*). It constructs and develops guns, torpedoes, mines, etc.

The Naval Construction Department (*Marinekonstruktionsamt*). It designs the new ships and supervises their construction.

There are independent sections for appointments, for the budget, for military engineering, for the medical branch, and for naval history.

The Navy outside the Admiralty is commanded by the Commanders-in-Chief of the Fleet at Kiel, of the Naval Station of the Baltic at Kiel, and of the Naval Station of the North Sea at Wilhelmshaven. They are full admirals and are placed immediately under General-Admiral Raeder. In this manner the organisation of the Armed Forces and, within them, of the Navy is simple and clear. It was not so before and during the war, and this led to much trouble and friction.

The flagship of the C.-in-C. of the Fleet is the armoured ship Admiral Graf Spee. Tactically, she and her two sister-ships are under the Rear-Admiral commanding Armoured Ships (*Befehlshaber der Panzerschiffe*, abbreviated B.d.P.). Cruisers, torpedo-craft, and minesweepers are placed under the Rear-Admiral commanding Scouting Forces (B.d.A., *Befehlshaber der Aufklärungsstreitkräfte*) in the light cruiser Nürnberg. The Leipzig, Köln, and Karlsruhe of the same class are attached to his flag. The Captain (D) (F.d.T., *Führer der Torpedoboote*) is stationed at Swinemünde. He commands three flotillas of torpedo-boats (two at Wilhelmshaven) and one of C.M.B.s. His flagship is one of these torpedo-boats, but he will transfer his flag to one of the destroyers now building. The four obsolete pre-war torpedo-boats of the 1st Flotilla were handed over to the Torpedo School as a training flotilla.

The Captain (M) (F.d.M., *Führer der Minensuchboote*) at Kiel is in charge of the 1st and 2nd Escort Flotillas at Kiel and (later) Cuxhaven, of the 1st and 2nd Minesweeping Flotillas at Pillau and Cuxhaven, and the 1st Motor Launch Flotilla at Kiel.

The Captain (S) (F.d.U., *Führer der Unterseeboote*) is immediately under the C.-in-C. He commands two flotillas, the first consisting of 12 small boats and named "Weddigen," after the famous captain of U 9, the second consisting of a number of larger submarines and named "Saltzwedel," after a very daring and successful commanding officer of Flanders submarines.

Kiel and Wilhelmshaven are still the chief naval ports, where

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all the bigger ships are stationed. Swinemünde, Pillau, and Cuxhaven, the " cradle " of minesweeping and in the war minesweepers' headquarters, serve as bases for destroyers and minesweepers. It is to be expected that with the increase of the light forces one or other of the many smaller harbours will be used as a naval port.

The task of the two Naval Stations is to provide the units of the Fleet with all their needs in the shape of men, material, provisions, etc., and to prepare coast defence. The Commanders-in-Chief, equal in status to the generals commanding the twelve army corps and military areas, are assisted by " second admirals," rear-admirals mainly in charge of recruiting, preliminary training, and manning, a somewhat arduous task nowadays under so quickly and fundamentally changing conditions. For the Baltic Station there are three *Schiffstammabteilungen* (naval barracks), each of the size of a battalion, at Stralsund, forming a regiment, and one at Kiel; for the North Sea one each at Wilhelmshaven, Wesermünde, and Glückstadt. There are special detachments (*Marine-Ergänzungsabteilungen*) at Eckernförde and Wilhelmshaven for the training of men who should have served before 1935 but were prevented by the Treaty.

Rear-Admirals or captains are in charge of the naval fortresses Kiel, Swinemünde, and Pillau on the Baltic coast, Wilhelmshaven, Wesermünde, Cuxhaven, and Borkum/Emden on the North Sea. With the exception of Wesermünde, each fortress has one battalion of coast artillery for manning fortifications and A.A. guns.

The Inspections, commanded by vice or rear-admirals, are under the Stations only in disciplinary and military matters. In " professional " affairs they communicate with Berlin directly. The Inspection of Education at Kiel is in charge of the Naval College in Mürwik, the Petty Officers' Training Establishments at Kiel, Friedrichsort and Wesermünde, the Sports School at Mürwik, and the arrangements for vocational training. It has quite a fleet of its own, the old battleships Schlesien and Schleswig-Holstein, the cruiser Emden, and the sailing ships Gorch Fock and Horst Wessel, the latter named after a young national socialist who lost his life fighting Berlin communists, and who has become a symbol of national revival.

The Torpedo Inspection is in charge of most things concerning torpedoes, submarines, communications, and gas protection, and supervises the necessary training and experimental establishments. The " Sperr " Inspection does the same for mining and minesweeping. It was formed in Kiel in October, 1936, and is in charge of the mine depots too. At the same time, the Inspection of Naval Artillery was transferred from Wilhelmshaven to Kiel. Gunnery training ships are the light cruiser Königsberg, the special ships Bremse and Brummer, and five smaller vessels. The western Baltic is an ideal training ground, but it is getting a bit crowded now. The Inspections of Ships' Engines (controlling the Naval Engineering Colleges at Kiel and Wesermünde) and of Ammunition Depots are at Wilhelmshaven.

Both Naval Stations have their net of communications and coast signal stations. Kiel is the seat of a commissary for the Kiel Canal,

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and the scout Grille is stationed there at the disposal of the Admiralty. The fishery protection vessels Elbe and Weser and the surveying ship Meteor have their home at Wilhelmshaven.

The great Naval Dockyard there and the Naval Arsenal at Kiel are placed immediately under the Admiralty as well as the Supply Bases at Pillau and Swinemünde. Most of the larger private dockyards are again employed for the construction of warships, being supervised by special bodies of naval constructors under orders from Berlin. The Navy Offices in the big commercial ports of Hamburg, Bremen, Stettin, and Königsberg are run by naval captains and in charge of a Rear-Admiral at Hamburg.

Officers.

When in the course of a few years a navy is increased to three times its former size and a naval air force is created virtually out of nothing, it is not easy to find the officers for this task in a short time. This difficulty is being overcome in several ways which, combined, give satisfactory results. They are :—

Increasing the number of cadets.
Shortening the period of their training.
Promotion from the ranks.
Recalling retired officers.
Giving commissions to mercantile marine officers.

The number of cadets is greatly increased for all branches of officers, which are now :—

Executive branch	(highest	rank	existing :		General-Admiral).
Engineering	,,	,,	,,	,,	Rear-Admiral.
Medical	,,	,,	,,	,,	Vice-Admiral.
Accountant	,,	,,	,,	,,	Captain.
Ordnance	,,	,,	,,	,,	Captain.

Thus paymasters, who formerly were officials with a special uniform, and ordnance officers, who after the war were made officials without uniform, are now part of the corps of naval officers. All branches wear the same uniform, the only difference being small distinguishing badges on the shoulder straps and on the coat sleeves above the gold stripes. Their training is uniform, too, as far as possible. They enter at an age between 18 and 21, after having passed the final examination of one of the public schools and served in a labour camp. In many respects, this system resembles British "Special Entry." Aspirants enter once a year at the beginning of April and receive preliminary military training together at Stralsund for 2½ months. This is followed by three months on board a sailing ship for the executive branch, and special training for the others with the exception of the future medical officers. These are appointed to one of the old battleships for 3½ months and then to the Academy of Military Surgery at Berlin. There they study like university students with the difference that for part of their holidays they are attached to a naval hospital.

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The other branches are made cadets and go on a cruise of 7½ months in one of the three training ships. They meet again as midshipmen at the Naval College, and take the Passing-out Certificate after a term of 7 months. Then follow 4 months of infantry and special training and half a year on board ship in the Fleet. This gives a total of 2½ years, after which they are promoted sub-lieutenants.

It is a great advantage of this system that the young officers of all branches serve together for a considerable time, and come to know and to understand each other well. This tends to give them a strong feeling of comradeship to the best of the service. This will be still more evident when the entries are smaller again and spend a whole year at the Naval College. Education is free with the exception of some 200 marks a year for uniforms, but even this is not compulsory.

A number of sub-lieutenants of the executive branch will be transferred to the Air Force as observers. After two or three years they either may go back to the Navy or volunteer for the Air Force. Specialists are selected by their superiors and sent to the respective courses. After serving on board for one year in the rank of sub-lieutenant, engineers are appointed to a Naval Engineering College for another year.

The technical training of ordnance officers is very thorough, as their chief duty is storing and keeping in order all the manifold and complicated weapons of a modern Navy. Some are even sent to a technical college where they study for four years and pass the final examination like other students. Most of them serve in depots and dockyards, at training and experimental establishments, some as specialists on staffs and on board ship. Their highest rank is now captain, and will be rear-admiral later. Stress is laid upon their being able to handle men and to be in charge of a body of officers.

There has been promotion from the ranks since 1918 with good success, but not to a great extent, owing to the small total number of officers. In the last two years the warrant officers still serving received commissions, and the pick of the petty officers were sent to the Naval College, where they are trained like the other midshipmen. Some were made supplementary officers after a "refresher" course. Mercantile marine officers were entered by both systems. In this manner quite a number of junior officers with a good knowledge of service matters were recruited quickly. The higher ranks were replenished by retired officers of all branches, who joined the Navy as *Ergänzungsoffiziere* (supplementary officers). They wear the uniform of officers on the active list, with an ellipse of gold thread around the distinguishing badge on the coat sleeve. Their age is between 35 and 55, and very few of them serve afloat. The majority are attached to staffs ashore and to training and experimental units, wherever competent specialists are wanted, thus making younger officers available for the growing fleet. Most of them re-enter as lieutenant-commanders or commanders, according to seniority on retirement, after a probationary term of three months. They

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may rise to the rank of captain, and there are even some rear-admirals among them. They number several hundred, about 120, *e.g.*, in the rank of commander as against 160 on the active list.

This system is transitory, of course. It works smoothly and satisfactorily in spite of the fact that in many places supplementary officers do duty under much younger officers on the active list, in some cases even under former subordinates of theirs. These are small difficulties, however, compared with the common task of reconstructing the Navy, and they are easily overcome by a strong spirit of comradeship and a sense of humour—which is not lacking in Germans quite so much as is sometimes believed abroad.

It is clearly understood that "a Navy is as good as its officers," and every effort is made to keep up a high standard. What seemed difficult at first, ensuring in so short a time co-operation and understanding between categories of officers differing so widely, proved much easier than expected. Numerically, the situation has eased considerably, now that the first large entry of midshipmen has been appointed to the Fleet, filling most vacancies, and the second is soon to follow. Two years of training is not much for a naval officer, and this means, of course, a lot of work for captains, divisional and other officers. But everybody who went through the disastrous events of 1918–19 knows what is at stake, and the younger ones make up by ardour what they lack in knowledge. Devotion to duty, experience in war and life, and youthful enthusiasm are being welded together by able leaders into a homogeneous corps of officers, conscious of the historic importance of their work and doing the utmost for the future of their country.

Petty Officers and Men.

The system, enforced by the Treaty, of manning the Fleet with long-serving professionals was not suited to German conditions. Service in the Navy was—and still is—very popular. No more than about 4 per cent. of the applicants could be enlisted, and these volunteered not simply to get a job, but in the hope of promotion. For the greater part they could not attain it from lack of vacancies nor could they be discharged, and grave disappointment was inevitable.

Under the new system the bulk of the Navy is manned by men who volunteer for four years, and some additional months for preliminary and special training before going on board. Their age is between 17 and 23, and labour service is obligatory before joining the Navy. There are no boys. Men honourably discharged on expiration of engagement are entitled to preferential treatment in getting work, and until they have found it to a monthly allowance for a specified time. Besides, they are granted a fixed sum for settling down in civil life again.

Conscripts of the sea-faring and coastal population are drafted into the *Küstendienst* (coastal service) afloat or ashore. After serving for two years in minesweepers or with the coast artillery

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they are discharged into the reserve. They, too, are entitled to preferential treatment in finding work. Suitable men may volunteer for two more years. Reserve officers have to take part in several courses and terms of practical training after the compulsory service of two years.

Petty-officer aspirants are selected from among the volunteers after two or three years of service. They are trained for six months at a Petty Officers' Training Establishment, for three months at an infantry course, and for three months in a sailing ship (seamen branch) or at special courses. They receive general instruction in everything necessary for a petty officer and get practice in teaching, giving orders, handling men, using small arms, etc. Great importance is attached to the creation of a strict sense of duty and honour and of a vivid *esprit de corps*. Military drill is not neglected, and on big parades these aspirants vie with any crack battalion of the Army.

Having passed these courses successfully, they are promoted petty officers and sent on board again. In due course and after some more special training they are made chief petty officers, and later *Feldwebel*, in which rank they wear fore-and-aft rig.

The place of warrant officers, who do not exist any more in the German Navy, is taken by *Oberfeldwebel*, picked and specially trained petty officers. As a rule, all petty officers, including the *Oberfeldwebel*, serve for twelve years counting from enlistment. In special cases, *Oberfeldwebel* will serve for a few years more.

On leaving the Navy these long-serving ratings do not receive a pension, but a subsidy of 1,500 marks and decreasing pay for three years. Moreover, they are entitled to a larger sum to set themselves up in civil life or to a post as official in one of the Civil Services according to the certificate they receive on finishing their extensive vocational training. The Government see to it that a large number of posts falling vacant are kept free for them. It is a sound idea to employ these well-trained and disciplined men in the country's service, and it shows them that they will be well looked after when they have to leave the Navy. It is not unusual to meet a former boatswain or machinist's mate in the quality of a custom-house officer or railway or post official, and in nearly all cases they are a credit to the Navy.

Miscellaneous.

The number of Protestant and Roman Catholic chaplains is increasing according to the growing size of the Navy. Spiritual duties for small garrisons are performed by civilian ministers.

Military jurisdiction was reinstated, civil courts not being satisfactory in many cases from want of military knowledge. No officer below commander in larger ships and captain in torpedo-boats, etc., is entitled to award punishment. Military law is less rigid than before the war, and its application is closely controlled by expert lawyers.

The Navy has a lot of games and sport. Football and handball

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U-BOATS AT KIEL.

Submarines of the 1st (Weddigen) Flotilla.

(By courtesy of the German Navy.)

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are about equal in the estimation of the sailors; Rugby and boxing have their friends, too. Swimming and athletics are national pastimes. Sailing is strongly supported by the Admiralty in the form of racing as well as of cruising. Over 200 boats, from dinghies to ocean-going yachts, are at the disposal of the "Naval Sailing Association." In summer, there is a regatta for service boats and yachts every Saturday forenoon in every port. The "International Naval Star-boat Races," held for the second time in 1936 at Kiel, are a successful step in the direction of good sport and mutual understanding between the Navies.

Tradition takes a prominent place on board and ashore. This was best shown when the Naval Monument at Laboe was inaugurated. There are units of Naval Storm Detachments and Naval Hitler Youth in many places, mostly on the coast or on the large rivers; the Navy League with about 60,000 members is represented all over the country. All these units and unions are in close contact with the Navy.

It is a busy time now for officers and men, but there is nothing they would like better. They are glad to know that the Navy is again in its right place in the nation as part of the Armed Forces; they, together with the National Socialist Party, form the foundation of the Reich. Germany has realised what sea power means and knows the need of an adequate Navy.

THE FLEET AIR ARM.

The Air Force being a separate part of the Armed Forces, the Navy has no flying service of its own. No. VI Air Area is set apart for co-operation with the Navy, and is organised in accordance with the requirements of naval and coastal warfare. Its air stations are placed along the coast from Friesland to East Prussia, with headquarters at Kiel. It is commanded by a general of the Air Force, who was a naval officer until recently. Most of his staff were naval officers, too, with quite a number of war-time pilots among them. All the front-line units of this Air Area, ashore and embarked, are commanded by the *Führer der Seeluftstreitkräfte* (Colonel commanding Naval Air Forces), stationed at Kiel, who is in close co-operation with the Fleet.

Two aircraft carriers of 19,250 tons are under construction, three armoured ships and five light cruisers are fitted with one catapult each. There are several aircraft tenders for base duties.

The following types of naval aircraft are mostly used: Dornier Wal for long-distance reconnaissance, Heinkel He 60 for reconnaissance, He 59 as three-purpose machine, and He 51 as fighter, besides Junkers, Heinkel, and Arado for training.

When No. VI Air Area was instituted the bulk of the personnel was provided by the Navy. Now volunteers, enlisting for four years, receive preliminary training in the *Flieger-Ersatzabteilungen*. They are made acquainted with the peculiarities of the sea right from the beginning. Rowing, sailing, and seamanship play a prominent

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part in the training. The same is the case with the young officers. So far, most of them received their fundamental education in the Navy.

The German Air Force is still in the making, and it will take some time to build up Air Area VI completely. Therefore, not much can be said about the efficiency of its organisation. In foreign countries opinions differ on the question of an independent Air Force and its value for a Navy. The essential point seems to be not so much the organisation as the realisation of the fact that an Air Force can successfully co-operate with a Navy only when it thoroughly understands its functions and activities. The Navy, on the other hand, must not demand impossibilities from the Air Force.

This very necessary mutual understanding between the two services and the knowledge of each other's ways and means is fostered by the German Navy and Air Command VI. It is to be expected, therefore, that their co-operation will enable the Navy to fulfil its task of defending the German coasts and protecting German trade and shipping.

F. O. Ruge,
Fregattenkapitän.

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CHAPTER VII.

FROM PETITIONS TO REVIEWS.

The Presentation of Lower-Deck Grievances.

The holding of the first Review of Service Conditions in the latter part of 1936, under the regulations introduced in 1932, was not essentially an innovation. It merely marked a new phase in a time-honoured custom of the Service which, first by petitions, and then by the pre-War unofficial "Loyal Appeals" or "Magna Chartas" and the post-War official Welfare Conferences, had been a feature of naval administration for over three centuries. The late Commander C. N. Robinson, in tracing the evolution of naval reforms, wrote: "The student of naval history cannot fail to be struck with the circumstance that every increase of pay or privilege was brought about by petitions. . . ." * At a Council of War, held on board the Swiftsure in 1654, consisting of Vice-Admiral J. Lawson, a rear-admiral, seventeen captains, five lieutenants and a master, to consider a petition presented by the seamen of the fleet, it was resolved unanimously that it was lawful for the seamen to present their grievances by way of petition and, with few dissentients, that the points complained of were real grievances, and that the vice-admiral should send the petition and these resolutions to the Protector.†

It was the failure of the Admiralty to deal with the men's petitions which precipitated the mutiny of Spithead in 1797. The pay of lieutenants had recently been increased and the captains were putting forward similar demands. The men naturally supposed every rank to have "their own immediate advantage for its object, and to have lost sight in that pursuit of every attention to the under-paid condition of the thoroughbred seaman." ‡ At the end of 1796, petitions for increased pay were forwarded to the Admiralty direct, but were ignored. The men then turned to Lord Howe, nominally in command of the Channel Fleet, but taking a cure at Bath. He received several petitions, but considering them to be the work of "some malicious individuals," and because they were unsigned, also ignored them, though later he sent them to the First Lord, Earl Spencer. The men, feeling that they had "made every effort to get their bitter wrongs redressed by the ordinary constitutional means," § decided that the only course was to refuse duty. They appointed delegates, who drew up a petition confined to five requests,

* "The British Fleet," p. 363.
† "Select Naval Documents," p. 68, from "Calendar of Clarendon State Papers."
‡ Captain Pakenham to Earl Spencer, quoted in "The Floating Republic," p. 11.
§ *Ibid.*, p. 25.

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an increase of pay, better food and full weight, greater care of the sick, leave to be granted in port, and wounded men to continue to receive pay, nearly all of which were eventually granted.

COMMISSIONED OFFICERS.

The commissioned officers, in addition to petitions submitted officially, had been able to forward unofficial ones by means of the Amicable Navy Society * instituted in 1739. Six years later this society was instrumental in obtaining the introduction of uniform for officers, and in 1749, when an attempt was made to subject officers on half-pay to naval discipline, three admirals and forty-seven captains signed a petition, the matter was brought before the House of Commons, and the project failed.†

In December, 1859, Admiral Duncombe, M.P., presented to the Admiralty a petition signed by 500 lieutenants. The First Lord, the Duke of Somerset, took no official notice, but directed his private secretary to acknowledge the memorial, "to which he will give his attentive consideration, and it will give him great pleasure, should he find himself at liberty, to improve the conditions of the memorialists." ‡ In the following year another petition, signed by all the lieutenants of the Channel Fleet, and approved by most of the captains, was presented to the Admiralty through the Commander-in-Chief. No reply was given, but a circular was issued which became Article 11 of the Queen's Regulations, and stated that "All combinations of persons belonging to the fleet . . . are prohibited. Individuals are not to combine, either by the appointment of committees or in any other manner, for the purpose of obtaining signatures to memorials, petitions, or applications, nor are they collectively to sign any such document."

WARRANT OFFICERS.

The warrant officers in 1792, following the example of the commissioned officers, who had revived their society a year earlier, formed at Devonport a society called a "Benefit Burial Club," which has had a continuous existence until to-day. Its members included masters, pursers and physicians, as at that time there was but one class of commissioned officer, the executive, all others being appointed by warrant. The work of this society was so successful that all except the gunners, boatswains and carpenters moved up to ward-room rank, the pursers being the last, in 1852.

Promotion to commissioned rank for lower-deck entries ceased in 1818, the last officer so promoted being John Kingcombe, who eventually became Admiral of the Red Sir John Kingcombe. The warrant officers pressed for its resumption without success until 1852, when a committee of flag officers considered the manning of the Navy

* Now the Royal Naval Benevolent Society. See their annual report.
† "The British Fleet," p. 363.
‡ "Lines from my Log-Books," Admiral Sir J. C. Dalrymple Hay, p. 354.

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and recommended the promotion of warrant officers to the rank of lieutenant for gallantry and daring in action. No such promotions were made for over 34 years, until Queen Victoria's Golden Jubilee honours list of 1887, when two officers were promoted who became known colloquially as "Jubilee Memorials." Thirteen years elapsed before any further promotions were made. During the Boer War one gunner was promoted for gallant service in the field, and Gunner Lyne, now Rear-Admiral Sir Thomas Spence Lyne, retired, was granted a lieutenancy in King Edward's Coronation honours list, for improvising sail power and bringing his torpedo boat into harbour when the propeller shaft broke.

From 1850 to 1852 the warrant officers' society employed a retired master, who was sub-editor of the *United Service Gazette*, to ventilate the disabilities of the class in the daily Press. When the Royal Commission on manning the Navy was appointed in 1858 the warrant officers presented a memorial and a "Proposed Scheme for improving the conditions of the Royal Navy," a deputation of twenty was received, and their secretary gave evidence. Twelve disabilities were put forward and eleven concessions were granted. Two years afterwards Parliamentary influence was brought to bear for the first time. Later, because of the regulation prohibiting combination, an ex-assistant paymaster was employed on a regular salary to advocate improvement of position and prospects, and a "Grievance Circular" was issued from time to time.

In the 'eighties the agent was dismissed, and the officers did their own work. In 1888 the *Naval Warrant Officers' Journal*, a monthly publication which next year will reach its 50th anniversary, was instituted by Mr. H. D. Capper, a young gunner at Whale Island. For several years previously he had been an anonymous contributor to the Press, and in the following year, on being appointed to the Admiralty, he became general secretary of the society. With two colleagues he was able to interest Peers, Members of Parliament and editors in the case of the warrant officers. The official attitude at the time may be judged by a statement of the Secretary of the Admiralty, Sir Evan Macgregor, who sent for Mr. Capper, and said, "Act, speak, and write temperately and you won't be interfered with. Then the Admiralty will be able to learn at first hand what the men of the Navy really think and really need, and you will be benefiting both the men and the Board." *

Early in 1890 the First Lord, Lord George Hamilton, announced that there was an immediate need for 100 lieutenants. The warrant officers issued "An Earnest Appeal for Promotion from the Ranks, Royal Navy," which showed that numbers were performing the duties of lieutenants and sub-lieutenants, being borne for this purpose, and that some were prepared to take the sub-lieutenant's examination for lieutenant. The Appeal was well supported in the London and Service Press and by M.P.'s, and a motion on the subject was put down in the House of Commons. It was opposed by the

* Autobiography of Lieut.-Commander H. D. Capper—"Aft from the Hawsehole," p. 131.

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Government and was not put to the House, and because of opposition from the commissioned officers the claim for early promotion to lieutenant was dropped.

Not long afterwards, in 1895, the Admiralty, to meet the shortage of lieutenants, introduced the Supplementary Lists of Lieutenants and Sub-Lieutenants, R.N., to permit Royal Naval Reserve officers to transfer from the Mercantile Marine to the Navy, but not to be eligible for promotion, except for war service. The first batch, known colloquially as "The Hungry Hundred," was followed by a second in 1898, dubbed "The Famishing Fifty." Meanwhile the warrant officers had, in 1890, put forward a "Revised Appeal" with a "Tree of Promotion," advocating warrant rank for a larger number of branches and lieutenancies for long and zealous service. Twelve years elapsed before such lieutenancies were granted in 1903.

PETTY OFFICERS' REPRESENTATIONS.

The petty officers, encouraged by the successes of the warrant officers, began in the 'eighties to form death benefit societies, and issued petitions on such subjects as victualling, railway travelling and plain clothes, at times working jointly with the warrant officers and with dockyard representatives. In 1904 a few petty officers at Devonport drew up an Appeal headed "The British Navy—Improvements Needed," afterwards called the first "Naval Magna Charta." It contained twenty items with sub-clauses and dealt exhaustively with lower-deck conditions. Instead of a general increase in pay, a number of small financial concessions were asked for, which included :—

A free kit.
Re-engaged pay of 2*d.* a day on re-engaging for pension.*
Good conduct badges for all ratings and 1*d.* each a day to be paid for them.†
Leave allowance in lieu of provisions.‡
Hospital stoppages to be abolished.§
Pensions to widows, children and dependent relatives.

Among other important requests were :—

Warrant and commissioned rank ‖ for all ratings.

Status of petty officers to be improved ; no P.O., or rating, to be searched in public streets by police ; and petty officers to be allowed to pass out of Dockyards "without being subjected . . . to the humiliating position of being passed out by a Corporal of Marines, their junior in rank."

No P.O. or N.C.O. to be disrated, except by a court-martial similar to that in force in the Army.

Better messing and cooking accommodation.

"The provision of bread baked on board ships to be considered an item of importance."

Wives and families to be allowed to travel from home to place where husband drafted, in British Isles, at single fare for double journey.

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* Re-engaged pay was paid to seamen ratings. It was abolished on October 1, 1907, except for men who had re-engaged before that date.

† Some ratings were paid and some were not.

‡ A similar allowance was paid to soldiers, and marines when ashore. It was not paid to the Navy and marines afloat until October 1, 1906.

§ A portion of the pay (one-half for a junior rating) was deducted after 30 days in hospital, while all pay ceased after a further 61 days.

‖ Lieutenants' commissions granted for long and zealous service were meant.

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The Appeal was published in the *Naval and Military Record*, with an editorial comment, and a discussion followed in correspondence. Its publication occurred shortly after Admiral Sir John Fisher became First Sea Lord, on October 21, 1904, but that night the Russian Baltic Fleet, *en route* to the Far East for the war with Japan, had opened fire on our Dogger Bank fishing fleet, the risk of war filled the papers, and the Appeal did not receive the attention it would otherwise have had. The advent, however, in January, 1906, of a Liberal Government pledged to social reform opened up a new era of lower-deck progress. The Appeal of 1904 had proved of such value in placing the disabilities of the lower deck before the Admiralty, senior officers, the Press and Parliament, that at the end of 1906 a joint committee of lower-deck benefit societies for the first time drew up an appeal, headed "Our Navy of To-day—A Loyal Appeal from the Lower Deck."

The next seven years were to witness the most important reforms in the history of the lower deck. Each year, until the War, the joint committee issued an appeal. It was recognised as a semi-official document, and the soundness of the requests put forward may be gauged by the fact that, in time, the majority were granted. Among the concessions was the extension of warrant rank in 1910 to the telegraphist, writer, ship's steward, police, cook, electrician and armourer branches and to the Royal Marines. A later development was the class appeals put forward by individual branches, which enabled the "Magna Charta" to be confined to more general matters.

In June, 1911, the joint committee issued a special "Loyal Appeal from the Lower Deck of the Fleet on the occasion of the Coronation of H.M. the King," in the "hope that Their Lordships at this period of National rejoicing, with the customary extension of Royal clemency, etc., may see fit to grant the men of the fleet these, to them, all important concessions." The requests were restricted to six and included: pension basic rate to be 11*d.* instead of 10*d.* a day; * pensions for widows, children, or dependent relatives; hospital stoppages to be abolished; and sanatoria for treatment of tuberculosis to be provided and maintained by the Admiralty.

REQUEST FOR DIRECT REPRESENTATION.

The 1909 Appeal was the first to be headed "Naval Magna Charta," and the first to contain a request for direct representation:—"That lower-deck representatives, selected by the men, shall have an official opportunity of direct representation to the Admiralty, at stated periods, in a similar manner to the concession enjoyed by men of H.M. Dockyards." Since 1906 certain members of the Board, including the First Lord and Parliamentary Secretary, had visited the naval ports in the Admiralty yacht for an annual inspection, and received deputations of delegates with petitions

* The original basic rate for pensions was 10*d.* for 20 years' service. In 1885 the service was increased to 22 years, but no increase was made in the pension.

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from the various dockyard trades. These delegates were allowed to be accompanied by a non-dockyard man, generally a trade union official, to present their case. It was a similar system to this which the lower deck had in mind.

Owing to the same matters being put forward at each port, this system was abolished in 1913, and a new scheme instituted, whereby petitions were submitted to the Admiralty through the local officers. Representatives of each class at all yards were then received at a combined interview by Admiralty officers and the Parliamentary Secretary. As the result of this change the request for representation in the 1914 " Magna Charta " read :

" That the Lower Deck, through their elected representatives, be granted the privilege of direct representation to the Admiralty, at stated periods. This would allow naval matters of general interest to be correctly explained by them in a disciplined and loyal manner, with mutual good result to the men and H.M. Service."

THE LOWER-DECK PRESS.

No survey of pre-War Service conditions would be complete without a reference to the lower-deck Press. In 1883 a commercial firm started *The Coastguard Gazette*, as a journal for their travellers. It was mainly an advertisement medium with a few items of coastguard news sandwiched in. The late Mr. Lionel Yexley, who had served in the Navy from 1877, been rated petty officer, and transferred to the Coastguard as a boatman in 1890, became a contributor. He was appointed editor in 1897. A year later he left the Service, foregoing his pension, and started the *Bluejacket and Coastguard* for the same firm. He vigorously attacked lower-deck disabilities, particularly the victualling and canteen systems, and was largely responsible for the appointment of the Rice Committee of 1900. In 1905 he started the first *bona fide* lower-deck journal, *The Fleet*, which is still published, and again attacked victualling and canteens, with the result that the Login Committee was set up in 1906.*

Yexley also published various outspoken articles on personnel matters in *The Fleet Annual*, notably " Summary Punishments " (1909), " Lower-Deck Promotion " (to commissioned rank) † and " Courts-Martial and Other Things," *i.e.* pay, etc. (1911), and " Naval Unrest : Its Cause and Cure " (1912). In 1908 he published his reminiscences of thirteen years' service afloat, " The Inner Life of the Navy," and in 1911 " Our Fighting Seamen," which dealt mainly with punishments, courts-martial, and other causes of unrest, and included as an appendix the " Lower-Deck Promotion " article.

In addition to naval correspondents and naval officers, another outspoken critic of lower-deck affairs was Mr. Stephen Reynolds. Educated at Manchester University, he became assistant editor of the *English Review*, and then lived with a fisherman's family at Sidmouth, Devon, entered into a partnership, and combined fishing

* For details of reforms, see " Brassey," 1936, " Victualling the Navy."

† Drafted by the late Lieut.-Commander N. F. Usborne, R.N., and originally published in *The Fleet*, 1910, p. 224.

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with journalism.* He contributed an article, "Naval Discontents," to the *English Review* of October, 1911, "Ships *versus* Men" to the September, 1912, issue, and a series of articles to the *Daily Chronicle*, 1912. These articles were republished in book form as "The Lower Deck, the Navy and the Nation," with the "Naval Magna Charta" for 1912 and certain new naval regulations as appendices.

DISCONTENT IN 1912.

About 1912 there was much discontent on the lower deck. Rear-Admiral J. F. Somerville, when Director of Personal Services, reviewed the position in a lecture at the Royal United Service Institution in October, 1935.† He showed how the low pay forced the men to maintain a low standard of living in their homes, quoted Stephen Reynolds's allegations in the *English Review* that the Admiralty drove hard bargains with bound men and exploited the conditions of the labour market, and mentioned his criticism of the officers. He also referred to letters in the *Naval and Military Record*, which indicated that the discipline enforced was often irksome and out of date, and that "a sailor joins as a boy and is treated as a boy throughout his career."

THE CONCESSIONS OF 1912.

In October, 1911, Mr. Winston Churchill became First Lord. In his first Navy Estimates speech, in March, 1912, he announced the appointment of a committee on discipline and the institution of the mate scheme of promotion to commissioned rank, thereby reopening an avenue to the quarter deck which had been closed for 93 years. In the following year this scheme was extended to the Royal Marines, and in 1914 to the engine-room branch.

The discipline committee, of which Rear-Admiral F. E. Brock was chairman, recommended drastic reforms in punishments, including the abolition of number 10A, whereby men under punishment were forbidden to smoke, had to eat their meals on deck in the presence of a sentry, and from nine to ten p.m. faced the paintwork on the quarter deck like naughty children stood in the corner. The committee did not recommend the trial by court-martial of petty officers before disrating, but this concession was granted and appreciably reduced the number of disratings.

The cost of living had considerably increased by 1912 and wages ashore had improved, but the seamen's pay had remained stationary at 1*s*. 8*d*. a day for over 50 years. In December, 1912, an increase of 3*d*. per day was announced, but only for ratings with more than six years' man's service, *i.e.* over the age of 24.

The "Magna Charta" for 1914 is of interest as the last one issued before the War. Although various concessions had been

* "The Letters of Stephen Reynolds," edited by Harold Wright, late editor of *The Nation*.

† "The Lower Deck, Past and Present," *R.U.S.I. Journal*, May, 1936, p. 305.

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granted in the ten years since the first "Magna Charta" was issued, it contained twenty-three items and sub-clauses and included :—

Pay of all ratings to be increased to ensure a reasonable wage for all.
Marriage allowance of 9*d.* per day, for over 6 years' and 1*s.* for over 12 years' service.*
Messing and victualling allowance to be increased by 1½*d.* per day, because of increase in price of provisions.
Leave arrangements of ships in Home Waters to be considered, "in order to effect a saving to the limited income of the men."
Improved messing, sleeping, workshop and office accommodation.
Employment of ex-naval men to be considered.

The following requests, which had appeared in previous appeals —some in different form—were repeated :—

Upkeep of uniform, "in order that the senior Service may be placed on an equality in this respect with the other public services of the State."
Hospital stoppages to be abolished.
Pension basic rate to be 11*d.* instead of 10*d.* a day.
Pensions to widows, children or dependent relatives, "observing that pensions are really deferred pay—vide statement of First Lord of the Admiralty, in the House of Commons, April 9, 1913."
Promotion to C.P.O., warrant, and commissioned rank for all ratings.

APPEALS DURING THE WAR PERIOD.

At the outbreak of the War the naval rating was the only State servant maintaining his uniform out of his own pocket ; he was still subject to hospital stoppages, even when the illness was no fault of his own ; and his wife was unrecognised. The Cabinet decision of September 4, 1914, to approve a separation allowance for the Navy,† eased the financial problem for married ratings for a time. No appeals were put forward during 1915 and 1916, but, after two and a half years of War, the increased cost of living—with no concessions comparable with war bonuses and other benefits in civil life—was early in 1917 the cause of great discontent throughout the Service. The aid of Members of Parliament was sought, and, on the motion for the Easter adjournment, Mr. Hogge, Liberal M.P. for East Edinburgh, raised several issues, including more pay for the lower ratings, pensions for men who had completed their engagements since the outbreak of War, and the abolition of hospital stoppages. The reply of the Parliamentary Secretary, Dr. Macnamara, gave little hope of any concessions and increased the discontent.

In the Grand Fleet it was considered high time that some action should be taken, but it was left, in the first instance, to the joint committees at the home ports to issue an Appeal to the Admiralty, the Press and Parliament. The writer left the Grand Fleet for Devonport at the end of June on promotion to warrant officer, and spent his leave in London, thus becoming aware of the situation at the home ports as well as in the Fleet. Actually, discontent at the naval ports, where the men had more knowledge of increased

* "That a special allowance be granted to all married men" appeared for the first time in the 1913 "Magna Charta."
† Winston Churchill, "The World Crisis," Vol. I, Appendix E, p. 523.

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H.M. FLOTILLA LEADER GRENVILLE.

Commissioned for Service, July 1, 1936.

(By courtesy of the builders, Messrs. Yarrow and Co., Ltd., Glasgow.)

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prices and civilian war bonuses, was even more serious than it was in the Fleet.

The joint committees of the societies, with petty officers on leave from the fleets, met in London in July, 1917, and drew up an Appeal in somewhat peremptory terms. It was headed "Disabilities which Require Redressing in H.M. Navy," and was confined to five requests, "to be immediately redressed": a rise of pay, varying from 1*s.* to 6*d.* per day; hospital stoppages to be abolished; withheld pensions to be paid; the basic rate of pensions to be 11*d.* per day, instead of 10*d.*; and the entry of civilians as officers and higher ratings to be stopped and opportunity given to ratings to fill such vacancies.

The Appeal was well supported in the Press, particularly in the *Weekly Dispatch* of July 29, with an article "More Pay for Bluejackets—Sea Scandals we must Remedy at Once," by Sir Clement Kinloch-Cooke, Conservative M.P. for Devonport. The next day the whole position was again discussed at length in the House of Commons, the Appeal being referred to. Again there was nothing in the Parliamentary Secretary's reply to indicate any likelihood of concessions. The effect on the lower deck is seen in a petition drawn up by the petty officers in the Grand Fleet, declaring "that statements made in the Houses of Parliament by Lord Lytton and Dr. Macnamara, during the recent debate on Naval Grievances," were deeply resented by the lower deck, and that the Admiralty did not realise "the seriousness of the situation." They emphasised that grievances existed which demanded immediate reform, "indispensably necessary for the continued efficiency of the Fleet, and the welfare of its personnel," and they could not "contemplate the present injustices being upheld by the Government without serious national results."

The Grand Fleet arrived at Rosyth from Scapa on July 17, and remained there for two months.* Leave was given, and for the first time since the outbreak of War large numbers of ratings were able to meet and discuss their disabilities. It was no uncommon sight to see ratings making speeches from the stage in the canteen and elsewhere. The Fleet left for Scapa on September 16, but discussions continued. "Socials" were held on board by petty officers and attended by their "opposite numbers" from other ships, and a circular letter and appeal were drawn up and voted on.

The Appeal read :—

"TO MY LORDS COMMISSIONERS OF THE ADMIRALTY.

"PETITION AND STATEMENT OF DEMANDS, presented by the Chief Petty Officers, Petty Officers, and Non-Commissioned Officers of His Majesty's Grand Fleet.

"May it please Your Lordships. Whereas the Loyal Appeal from the lower deck, known as the Magna Charta, has been recognised by you as the legitimate method of bringing before Your Lordships' notice the several disabilities arising from time to time, and whereas Your Lordships have not hitherto favourably considered requests thus put forward, we would petition Your Lordships to grant the following demands as affecting all ranks and ratings."

* "Memoirs of Sir Roger Keyes," Vol. II, pp. 105 and 110.

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The demands were six in number, and on the same lines as the London (joint committee) appeal, except that a fifty per cent. increase in pay was now asked for, together with a substantially increased victualling allowance. The circular letter stated that the petition had "been drawn up with a view to the senior ratings of every ship in the Grand Fleet requesting their respective captains to forward the petition. . . . We propose that each ship presents the petition during the second week in October, so that it may reach the Admiralty before the opening of Parliament in November. We are in a position to assure you that we can honestly hope for every assistance from the C.-in-C. in presenting this loyal and unanimous petition in accordance with strict service procedure. . . ."

Two petty officers were tried by court-martial at Scapa Flow on October 24, for "combining to write or causing to be written and circulated to certain of His Majesty's Ships two undated letters referring to a certain anonymous 'Petition and Statement of Demands dated October, 1917. . . .'" They received only a nominal sentence of the deprivation of two good-conduct badges and the good-conduct medal, and were discharged to their depot. The punishment was mainly a financial one, but this was made good by a subscription in the Fleet. After the War the sentences were remitted.

Meanwhile, on September 29, 1917, the Prime Minister, Mr. Lloyd George, had written to inform the First Lord of the Admiralty and the Secretary of State for War that the War Cabinet had decided to raise the pay of the Army and Navy. The pay of able seamen was increased by 3*d.* after three, instead of six years, but the basic rate remained the same as in 1860; * hospital stoppages were abolished, with the exception of V.D.; pensions were to be paid for twenty-two years' service, and to men who had completed their engagements; a kit upkeep allowance was granted and the messing allowance increased from 5½*d.* to 7*d.* per day. In other words, four items of the appeals were completely granted and two further concessions made. In November a rise of pay from 2*d.* for able seamen ratings to 5*d.* for chief petty officers was granted.

By August, 1918, the lower deck had become intensely dissatisfied to see strikes among civilian workers, and even the Police, producing for them large increases of pay or bonuses while the Navy was receiving only doles of coppers.† Political action was being canvassed. Mr. Yexley, who had attended meetings of ratings at the ports and had been authorised to submit an Appeal to the Admiralty, struck out on a new line on his own responsibility. On September 4, 1918, he had twenty-five copies printed of a confidential pamphlet setting forth sixteen points of discontent. Copies were sent by registered post to the King, the Prime Minister, the members of the Cabinet, and the Board of Admiralty. The outcome fully justified his action. Mr. Lloyd George authorised Sir Eric

* "The substantive rate was established at 1*s.* 7*d.* a day in 1854, and 1*d.* a day was added in 1860 for trained men. This 1*d.* was incorporated in the substantive pay in 1907." *Hansard*, June 17, 1912.

† *The Times*. Obituary, Yexley, March 21, 1933.

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Geddes, then First Lord, to deal with the matter, and he interviewed Mr. Yexley. As an example of the concessions that resulted it may be mentioned that the leave allowance of 8½*d.* a day (the rate paid when first introduced twelve years previously) was raised to 2*s.* 1*d.*, and made retrospective to May 1.

Early in 1918 the warrant officers had put forward an "Earnest Appeal," various class appeals appeared from the lower deck, and the Admiralty appointed committees to investigate the conditions of service in warrant rank and certain branches. In September a number of concessions were announced for warrant rank and for several branches of ratings. Those for warrant rank included the institution of a scheme of accelerated promotion to lieutenant by examination, which continued until December, 1930, and was then abolished. The rank of commander, by selection, for lieutenant-commanders from warrant rank was also established in 1918, but though the pay for commanders (ex-warrant officer) is still included in the "Appendix to the Navy List," none has been promoted to this rank.

In October–November, 1918, an "Appeal of the Petty Officers and Men of the Royal Navy," with the sub-title "Injustice to the Lower Deck and How it can be Remedied," was drawn up by the joint committees, and printed, but the Armistice occurring a few days later, its issue was delayed. It was confined to seven items, with three sub-clauses, and included : an all-round increase of pay of 1*s.* 6*d.* a day ; an increase of 200 per cent. in basic rate of pension ; pensions to widows ; promotion of active service ratings instead of the entering of civilians ; greater educational facilities ; and "that the Lower-Deck Associations be recognised by the Admiralty as a means of direct communication with organised and loyal thought on the Lower Deck."

THE LAST LOWER-DECK "APPEALS."

At the end of 1918 the Admiralty decided that pay, allowances and pensions needed thorough and expeditious revision, and on January 6, 1919, appointed a committee under Admiral Sir Martyn Jerram to investigate the whole question. For the first time ratings, representative of twelve branches, were attached, in an advisory capacity, to an Admiralty Committee. The Commander-in-Chief, Grand Fleet, Sir David Beatty, also appointed a committee.

On January 18 over 100 delegates from the lower-deck societies met in London, the Press being present, to draw up a united appeal for the Jerram Committee. The twenty requests were confined to pay and allied questions. Among them were : an increase of pay, boy by 2*s.* a day, ordinary seaman 3*s.*, A.B. to C.P.O. 4*s.* ; a pension basic rate of 2*d.* a day for each year's service ; separation allowance, allotment concession, kit upkeep allowance, and free railway passes for leave (all War-time concessions) to be made permanent ; re-engaged pay of 6*d.* a day ; concessions to date back to October 1, 1918, and, in addition, "recognition of the Lower

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Deck and Royal Marines, with a view to giving facilities to state their disabilities periodically." The Jerram Committee had sat for only three weeks when the Admiralty announced that sufficient evidence had been received to satisfy them that it was "necessary at once to announce additional interim increases" to be paid from February 1. The pay of an able seaman, which until November, 1917, was 1*s.* 8*d.* a day and was then raised by 2*d.*, was increased to 3*s.* 4*d.*, and other ratings and officers were given similar increases. When the final decision was made, the pay of an A.B. was fixed at 4*s.*

Another conference of delegates from the lower-deck societies was held in London on May 24 to discuss the results of the Jerram Committee. Two Members of Parliament, Commander Viscount Curzon, R.N.V.R., and Colonel Malone, attended. This conference passed resolutions that every item "not approved" should be referred back to the Admiralty.

WELFARE CONFERENCE SYSTEM.

On February 24 the Admiralty had announced that, as the result of the successful working of the joint conference of officers and men on the pay question, it had been decided "to make permanent arrangements on the same lines for bringing to notice from time to time matters affecting the well-being of the men," and so initiated what became known as the Welfare Conference system.

The first official Welfare Committees met at the home ports in October, 1919. Elected representatives of the men drew up class requests and general requests to be forwarded to the Admiralty Welfare Committee, which consisted of the Personnel Committee of officers and eighteen ratings as advisory members. Among the more important of the fifty-four requests were: The reconsideration of recommendations of the Jerram Committee not approved by the Government; a permanent separation allowance; pension and full pay for ratings retained after completing time for pension; pensions for widows and compassionate allowances for orphans; opening to all branches of the mate scheme of promotion to commissioned rank; and promotion of permanent ratings in war-time before temporary officers were entered. The committee also asked for an improved system of messing; better galley accommodation; the institution of laundries in all ships and establishments; greater educational facilities; longer leave and free railway warrants; the cash-purchase system for clothing, soap and tobacco; and that Admiralty and other orders affecting personnel should be prominently displayed on notice boards.

The 1920 Welfare Committee got to the inter-port stage at Devonport, but then requested "to be allowed to dissolve," one of the reasons being the fact that the answers to the 1919 requests had not yet been announced. The Admiralty thereupon decided that the Welfare system should "remain in suspense at their Lordships' discretion." *

* Admiralty statement to the Press, August 10, 1920.

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At the end of 1920 the Admiralty announced that as it was their expressed intention " to make an efficient machinery to enable them to be informed fully as to the aspirations, grievances and disabilities of the lower deck from time to time, Their Lordships are unable to recognise such matters as coming within the proper sphere of the Lower-Deck Benefit Societies." In other words, the Societies were to confine their activities to benevolent affairs and not engage in " welfare work." *

In November, 1921, after the Welfare machinery had been in abeyance for over a year, the Admiralty announced that the system would be revived in 1922 in a modified form. To give more time for the requests to be dealt with, committees were to meet biennially instead of annually. The arrangement by which representatives of the men met in London was abolished, and all meetings were to be held at the home ports, the inter-port meeting being held at each of the three ports in rotation. Confined to shore establishments and Reserve Fleet ships at the home ports, in its final form the procedure of the Welfare Conference system was that port group request meetings of elected representatives formulated representations affecting particular branches, and port general request meetings formulated general requests. Inter-port meetings then co-ordinated and formulated final requests. These were sent to the Commanders-in-Chief of the home ports, who reported their views to the Admiralty. Welfare Conferences under this system were held biennially from 1922 to 1932, and the last conference put forward a total of 111 requests, 29 general and 82 group, or class, requests.

In 1932, following the unrest at Invergordon in September, 1931, the Admiralty decided to abolish the Welfare Conference system on the ground that it did not apply to the sea-going fleets and foreign stations, and announced that an Admiralty Review of Service Conditions would replace it.

REVIEW OF SERVICE CONDITIONS.

The Admiralty Review of Service Conditions applies to the whole of the Navy, and the procedure is based on the divisional organisation and the normal association of officers and men. Divisional representatives are selected by their officers. The men may individually inform their representatives of questions which they wish brought forward, but organised meetings for this purpose are contrary to the regulations. Representatives assemble under the presidency of the divisional officer to formulate requests. These are considered by a ship committee, consisting of the commanding officer, executive officer and heads of departments, who call before them such officers and men as they consider desirable. Reports of ship committees are sent to the Commander-in-Chief, who appoints fleet committees to consider them. The Commander-in-Chief then forwards the reports, with his own remarks, to the Admiralty, for consideration by the Board.

* A.F.O. 3657, December 22, 1920.

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The first Review began in September–October last, and a total of over 4,000 requests was received at the Admiralty,* the approximate figures from each command varying from 30, from both New Zealand and the Coast of Scotland, to 310 from the Home Fleet.†

At the beginning of January the Admiralty announced that reviews had been received from a number of commands, and that consideration was being given to them as they arrived, but that no decisions could be given until all had been received and examined. Full investigation of all the requests would necessarily require some considerable period of time; but as it might well prove possible to reach decisions on some of them at an earlier date than others, Their Lordships intended to promulgate their decisions by instalments, and then finally to recapitulate them in a single order.‡

The new system, according to the custom of the Navy, has been evolved after many years of development. Whether it is the best scheme for the Sea Service remains to be seen. Time will show if modifications are necessary, and, if so, it is to be hoped that the words of Lord Fisher, in a letter written to Lionel Yexley, will be remembered, "Don't wait for agitation; things have got to come; a wise administration foresees them and prepares accordingly."

H. P.

* *Hansard*, January 27, 1937, col. 921.
† *Hansard*, December 16, 1936, col. 2453.
‡ A.F.O. 3086, December 31, 1936.

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CHAPTER VIII.

Progress in Naval Machinery, 1909 to 1936.

In the year 1909 an article was published in "Brassey's Annual" surveying the then existing situation regarding the principal types of machinery fitted in naval vessels, briefly reviewing the progress that had been made in the previous decade and hazarding some suggestions as to the probable lines of future development. No such review has appeared in these pages during the intervening period, and it seems particularly appropriate that an attempt should be made to bring the story up-to-date in 1937, the centenary of the Engineering Branch of the Royal Navy.

The intervening years may be divided into three periods, viz. 1909–1917, when no marked technical progress was made, but when the rate of expansion of the fleet was at a high level to meet foreign competition; 1914–1918, the war period, marked by intensive production rather than by major engineering advances, which latter were represented principally by the complete elimination of coal in new construction of all classes and by the rapid development of mechanical reduction gearing; finally, 1918–1937, the post-war period with which this article is mainly concerned.

There has not during the post-war period been any single engineering development of an outstanding and fundamental nature, such as was the adoption of the steam turbine in 1904, but progress has rather been a matter of gradual improvements in all branches, the results of which are not readily appreciated except by comparison of the overall effects these have had regarding the weight and space occupied by the machinery and the fuel expended for propulsion purposes. It will be evident then that a complete discussion of advances covering so wide a field must necessarily be both technical and too extensive for the purposes of an article such as this, which must therefore be understood as dealing with only certain aspects of the subject and treating these in a popular rather than in a scientific manner.

It should be stated at the outset that the design of warships during the period since the war has been profoundly influenced by the Washington Treaty, which defined in effect the maximum weight of material that might be worked into the fabric of each vessel of any given class. This arbitrary limitation meant that, given equal skill in design and construction, superiority over the ships of another nation could only be attained by a wiser distribution of the available weight between the component parts of the vessel, viz. hull, protection, armament and machinery, than that decided

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upon by a potential enemy. Under such conditions superiority depends mainly upon circumstances being exactly suited to the designer's choice, and thus is introduced an element of chance that has intensified the struggle for technical supremacy, which has been directed primarily to the reduction of the weight and space necessary for each of the units comprising the whole ship.

The individual factors affecting the weight and space occupied by the machinery have been very fully covered in a previous article in "Brassey's Annual," 1929, p. 92, and it is unnecessary to recapitulate and enlarge on these. There have, however, been four main fields of advance with which it is proposed to deal here, viz. :—

(*a*) The adoption of oil as the standard fuel for all classes of naval vessels.
(*b*) Progress in steam boilers.
(*c*) The development of the use of reduction gearing and of steam at higher pressure and temperature in steam turbines.
(*d*) The use of special materials for engineering construction.

OIL FUEL.

The history of the development of oil fuel for use in naval boilers by the engineering branch of the navy is well known, while its advantages for naval purposes compared with any other fuel have from time to time been fully discussed in public—thanks to the efforts of the many patriotic persons who have been anxious that the utmost use should be made of our national fuel, coal, not only to assure supplies in the event of a war in the region of these islands, but also to relieve the distress in those areas where this product was once so extensively mined.

It may be of interest to recapitulate here the remarkable advantages conferred by oil fuel ; these are :—

Increased endurance for a given weight of fuel—approximately twice that obtainable with coal.
Increased power and speed for a given weight of machinery, or alternatively less weight and space for given power.
Increased flexibility.
Reduced complement.
Full power can be maintained while fuel lasts.
Complete control of smoke.
Ease and cleanliness of fuelling.
Readiness of transport to distant stations and smaller quantity required in storage.
No deterioration in storage.

Regrettable as it may be from some aspects, there is no doubt whatever from the strictly military standpoint, and especially under the limitations placed on designers by international agreements, that no other fuel can be admitted as a competitor to oil for all normal men-of-war. It is an incontestable fact that on a given displacement

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H.M. DESTROYER HERO.

Commissioned for Service, October 21, 1936.

(By courtesy of the builders, Vickers-Armstrongs, Ltd., Barrow-in-Furness.)

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it is not possible to provide the same military characteristics in a coal-burning vessel as in one using oil fuel.

The experiments that have been made with a view to employing at least some coal by mixing it with oil have not succeeded in producing a composite fuel that is a completely satisfactory substitute for oil alone for naval use. The practical disadvantages (and capital cost) associated with such a development have not been considered commensurate with the relatively small quantity of coal that could thereby be consumed. It is estimated that even if coal were the principal fuel of all the ships in the Navy, the country's production of coal would be increased only by less than $\frac{1}{3}$ of 1 per cent. The use of pulverised coal, too, has proved undesirable for any marine purposes, and has, it is believed, been abandoned even in those few instances in the merchant service where economic conditions were peculiarly suited to its use.

On the other hand, oil fuels produced from coal either by low temperature carbonisation or by hydrogenation processes have been successfully burned under naval boilers and used in Diesel engines in submarines. The development of adequate supplies from such sources, which certainly does not appear to have yet become a commercial proposition, does not come within the scope of this article. During the post-war years marked advances have been made in oil-burning methods with considerable improvement in economy, such as, for instance, the introduction of air preheaters.

STEAM BOILERS.

The post-war years have seen the complete disappearance of the large-tube boiler, owing to considerations of weight and space. The general introduction of superheated steam into the Navy during this period was, as will be mentioned later, fundamentally connected with the idea of arranging the superheater tubes in a position intermediate between those exposed to the fire and those at the uptake side of the boiler. The three-drum type was peculiarly well adapted to this particular arrangement, and has thus been the standard form fitted in all vessels built since 1918.

A Johnson boiler, patented by Mr. John Johnson, Superintending Engineer of the Canadian Pacific, has been fitted for trial in the destroyer Hyperion, after considerable development work extending over several years. This unit comprises a steam drum connected to a single water drum by a number of considerably curved tubes, a row of which is also arranged across the back of the boiler. The main advantage of the design lies in the fact that the water tubes of the boiler constitute the major part of the furnace boundary, thus reducing the weight of the brickwork necessary to protect the casings. It is unfortunate, however, that the shape of the tube nest does not so readily permit of the fitting of superheaters as does that of the standard three-drum type.

Modern developments, particularly on the Continent, suggest that the boiler of the future may well be of a type in which circulation

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is positively provided by means of external pumps. The suitability of such boilers for naval purposes can only be determined after full-scale trials at sea, as the problems to be met are very different from those on land service; but it must be appreciated that the additional pumping units involved are a definite disadvantage, which may, however, be offset by increased flexibility and savings in weight and space. It should be observed, however, that the limits of forcing of the standard three-drum type do not appear to have been reached as yet, and this simple well-tried design is still in the van, whether judged from the standpoints of weight, space or efficiency.

TURBINE SPEED REDUCTION SYSTEMS.

It had long been realised that the speed of rotation desirable for steam turbines, with economy, weight and space considerations in view, was unsuited to that giving reasonable efficiency and freedom from erosion of the propellers. Two principal methods of speed reduction between the prime mover and the propellers have been advocated, namely (*a*) by mechanical reduction gearing, and (*b*) by electrical means. The former was introduced into the British Navy in the destroyers Badger and Beaver in 1911, the high-pressure turbines only being geared. These were followed by the all-geared destroyers Leonides and Lucifer, which went directly into war service in 1914. This system appeared to be so satisfactory that its use was rapidly extended during the later war period, finally being embodied in the design of the "Hood" class with a maximum output of about 36,000 S.H.P. on each shaft.

Meanwhile the electrical system was tried in U.S.N. in the collier Jupiter in 1913, and proved sufficiently satisfactory to warrant its adoption in the U.S. battleship New Mexico, followed in due succession by a number of other capital ships, culminating in the installations in the Lexington and Saratoga (now aircraft carriers) of the enormous output of 188,000 S.H.P. on four shafts.

It was but natural therefore that during the early years of the post-war period much consideration was given to the desirability of adopting this form of drive in the British Navy, and many tentative designs on this basis suitable for vessels of all types were produced and investigated. Despite the apparent attractions of this method it became evident that, for British needs at least, mechanical gearing is on balance the more suitable arrangement. This principle has formed the basis of all modern designs, excepting only in the minelayer Adventure, where Diesel engines are arranged to drive the propeller shafts by electrical means for cruising purposes. The decisive virtues of the mechanical system that determined this policy were considered to be :—

(*a*) The fundamental military advantage of avoiding the additional link in the chain of transmission, represented by the electrical portion of the reduction system. This link is held to be distinctly vulnerable.

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(*b*) The lower transmission loss, which is estimated to be between 5 per cent. and 10 per cent. in the electrical system. It appeared that in a given vessel and allowing a given weight and space for the machinery, the power and economy of a mechanically geared installation could always be made equal, and generally superior, to those of an electrical one.

(*c*) Considerably lower cost.

Development of Mechanical Reduction Gearing.

Double helical gears with involute teeth arranged to give a single reduction in speed have been adopted in all British men-of-war since the introduction of mechanical gearing, with the exception of a few vessels where another tooth form to be referred to later has been fitted.

Although the first installation represented an outstanding advance in the proportions of mechanical gearing, such was the skill of the firms entrusted with this work that major troubles involving renewal were limited to five cases out of a total of some 720 sets. In general there was an astonishing freedom from vibration and an acceptable degree of noise, the life of the teeth exceeding all possible expectations. In these happy circumstances it was but natural that in these early years designers should be content with the basic results achieved, and that progress should be mainly directed to improving the quietness of the gears, some of which were for no very evident reason undesirably noisy.

The whole art of gear cutting was critically examined, mathematical analysis and close investigation of individual cases enabling rigid specifications to be evolved for regulating the process, while methods of measurement were decided upon to enable criteria to be established. The general standard of accuracy of modern gears has thus been greatly improved, but none the less the degree of quietness varies very appreciably and it is not yet possible to produce with certainty gearing that is as relatively silent as some of the best examples have proved to be.

Double Reduction Gearing.

This was introduced shortly after the war in several merchant vessels where low propeller speeds are desirable, but although further savings in weight and space might be thus obtained, the resulting somewhat unsatisfactory experience has acted as a deterrent to naval applications of this device. Such designs have, however, been adopted to a limited degree in U.S. Navy, having received further impetus in recent years as a means of enabling steam at abnormally high pressure and temperature to be economically employed without incurring the practical disadvantages associated with a multiplicity of turbine cylinders. It appears at least possible that similar use may be made of double-reduction gearing in the British Navy, since the adverse experiences with earlier units of this type, coupled with

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modern knowledge of gearing problems generally, may render practicable this line of progress.

V.B.B. Gears.

A new form of tooth was proposed by Bostock & Bramley in 1922, the patent rights being subsequently acquired by Messrs. Vickers-Armstrongs, who have built a number of such units for both naval and merchant use. The teeth on the pinions differ in shape from those on the gear wheel, the former approximating to normal involute form, while the flanks of the latter are concave, so tending in engagement to "envelop" the pinion teeth. The inventors claim that by this means the distribution of the load and the maintenance of the oil film is appreciably improved, so that higher loads can be carried than are feasible with the standard involute tooth. Further, the arrangement is such that the point of contact never crosses the pitch-line, at which position in normal gears all sliding action between the teeth ceases momentarily, subsequently reversing its direction. The heavy pitting in the region of the pitch-line that frequently causes the failure of gear teeth has, with some reason, been attributed to these changes in the type and direction of contact in that vicinity; Bostock & Bramley claimed therefore an advantage for their gears in this respect.

Whether due to this cause or to the shape of the teeth themselves, it is none the less a fact that the pioneer naval gears fitted by Messrs. Vickers in H.M.S. Crescent have satisfactorily withstood loads some 35 per cent. in excess of those in contemporary practice for involute teeth, while noise and vibration are in no way abnormal.

A.A. Gears.

Contemporaneously with the foregoing developments, Messrs. Parsons Marine Steam Turbine Co. were also experimenting with gears in which contact took place only on the addendum of the pinion teeth (whence their name "All Addendum" or A.A. gears), the teeth being of involute form. It was established that such gears could be safely loaded considerably above normal practice, the practical limits not yet having been determined. A trial unit of the A.A. type was fitted to one set of main engines in H.M.S. Delight in 1932, and ran with complete satisfaction, the condition of the teeth after exceptionally hard usage being markedly superior to that of the usual gears, despite the greatly increased loading.

Gearing of this type, or in a few instances units with V.B.B. teeth, has been adopted as standard practice in all classes of men-of-war completing since 1935 (commencing with the cruiser Arethusa and destroyers of "Fearless" class), a considerable reduction in length of the gear face being thereby rendered practicable, with the associated advantage of enabling the usual central bearing to be dispensed with. Savings of as much as 2 feet in the length of the machinery have been rendered possible by these means in current designs.

Future progress is likely to develop along these lines, the tooth

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loading being gradually increased as experience accumulates. It should be remarked, however, that tooth shapes (such as the V.B.B.) which require specially shaped cutters for their formation are considered to be inherently less suited for extreme accuracy of production than the involute tooth, which can be "generated."

STEAM TURBINES.

Use of Steam at High Pressure and High Temperature.

The attention of designers was drawn at an early stage in the development of the steam turbine to the possibilities of increasing its economy by making use of high-pressure superheated steam, and it was not long before plant embodying such features was installed in shore power stations; information as to future possibilities in this direction gradually accumulated in the course of time. Amongst the early naval turbine installations were a few instances in which a low superheat, rising perhaps to a maximum of 100° F. at full power, was introduced. The intention in such cases was to obtain really dry steam, so avoiding the disadvantage associated with priming, etc., especially when increasing speed rapidly, and there appears to have been no real effort to take advantage of the economy in steam consumption associated with superheat. These pioneer superheaters were located on the uptake side of the last row of generating tubes in the boilers, and much trouble with joints and expansion glands arose from their use, since they acted as condensers both when raising steam and also at very low powers; the degree of superheat also varied considerably, depending as it did upon the rate of forcing of the boilers, so the advantage gained was very small indeed under cruising conditions.

Investigations by Admiralty officers indicated that it was theoretically possible to place the superheater at such a point in the tube nest that the rate of heat absorption would always be proportional to the evaporation of the boiler; or, in other words, the final steam temperature would be approximately constant at all outputs. This important discovery was fully investigated by the Admiralty in an experimental boiler, and, proving to be well founded, has enabled superheated steam to be applied for naval services without incurring the serious practical disadvantages, referred to above, experienced in earlier forms of superheater. Had it not been for this development, there is little doubt but that the general adoption of superheated steam in the Navy would have been greatly retarded. The primary advantages to be expected from the use of highly superheated steam are decreased weight and space, coupled with increased economy, but rapid manœuvring is facilitated by the great reduction in the amount of water reaching the engines should priming of the boilers occur.

The design of the auxiliary engines did not, however, keep pace with that of the main units, reciprocating machinery driven by saturated steam being still fitted in the first superheated steam

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installations. This arrangement not only led to undesirable complication and weight, while detracting from the possible economy, but also largely nullified the potential improvement in flexibility since priming of the boilers was still liable to prejudice the working of important auxiliaries. These disadvantages were quickly realised, and the use of turbo-driven auxiliaries has been increasingly developed, except in a few instances, where the balance of advantage still remains with the reciprocating type.

During the post-war years a vast amount of knowledge has accumulated regarding the effects of high temperature on the properties of the materials used for construction, and this information has enabled rapid advances to be made in the initial temperature of the steam. Naval practice in this direction has lagged behind the most advanced designs in the Mercantile Marine, which in turn have followed after shore practice. The reasons for such apparent conservatism are fundamental, and do not demand elaboration here; but the present position is that while steam temperatures of 800° F. are common in shore power stations (over 1,000° F. is being used in isolated cases) and 750° F. is not unusual for mercantile vessels, naval practice had only exceeded 700 °F. in a few instances. There are some marine installations, however, working at temperatures above 800° F., all of them having been made in Germany, which is leading in this respect.

The complications associated with the designs incorporating superheated steam for the main engines and saturated steam for the auxiliaries, coupled with the work involved in carrying out the somewhat frequent examinations of the superheaters that are prudent with all such innovations, caused the suitability of superheated steam for naval purposes to be challenged from time to time, more especially as minor difficulties regarding maintenance of the steam tightness of valves, joints, etc., have arisen during the process of evolving the most suitable materials and designs for such parts. It must not be forgotten, however, that this field is comparatively new, and that difficulties such as the foregoing are "teething" troubles which even at the date of writing have been sensibly diminished. From the strictly naval aspect, the real criterion is whether or not by the use of superheated steam it is possible to provide machinery of the desired horse-power in less space and on less weight than if saturated steam were employed, full regard being paid to the vital qualities of reliability and ease of handling. There is a further important requirement for the machinery of vessels, such as our own, that may have to keep the sea for long periods, and that is a large endurance at low speeds. The advantage of superheated steam in fuel consumption at full power is illustrated by Table I. Columns A and B relate to two contemporary destroyers built some years ago. Column C shows the somewhat striking advance that has been made in a matter of some seven years.

Naval experience indicates that this advantage, accompanied by reduced weight and space, can be obtained without any sacrifice of reliability, and with a marked improvement in the ease and rapidity with which large changes in output may be made. This

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TABLE I.

	A.	B.	C.	D.
Steam Pressure, lbs. per sq. inch	300	300	300	500
Steam Temperature	Saturated	622° F.	642° F.	750° F.
Fuel Consumption at Full Power. Lbs. per S.H.P. per hour	0·894	0·85	0·75	0·61

last advantage arises principally from the general use of turbo-driven auxiliaries and to the absence of water from steam lines, but is of course due in part to improved arrangements and methods of handling.

The gradual advances in superheat have been accompanied by complementary increases in the steam pressure, and here again land practice has led with pressures as high as 2,840 lb. (Langerbrugge, Belgium), the maximum figure attained in mercantile marine practice being 1,900 lb. (S.S. Conte Rosso); while in men-of-war 600 lb. has yet to be exceeded. It should be noted, however, that the disparity is not so great as the foregoing figures would lead one to suppose, since the pressures in general use in current practice are more nearly, say, 1,000 lb. for land stations and 600 lb. in the mercantile marine.

The use of high-pressure steam is associated with definite improvements in economy at full and medium loads, while no serious difficulties or disadvantage have been encountered. From the purely naval aspect, however, it appears that little weight and space can be saved by employing steam pressures much above 300–400 lb. If due use is to be made of the potential economies accompanying further rises in pressure above this point, it becomes necessary to provide more than two turbine units for each set of main engines, or else to increase the rotational speed of the turbines, necessitating the fitting of double reduction gearing.

A multiplicity of turbine units involves difficulties in the control of the turbine glands when changing speed rapidly, and is thus undesirable for any class of vessel save perhaps capital ships. This practical disadvantage may be much reduced by modern methods of gland control, but even so the work of examination and maintenance is necessarily increased by such a departure from the simple two-turbine unit arrangement. The alternative use of double reduction gearing appears to offer possibilities which are being explored principally in U.S.A. The desired large reduction in speed could of course be obtained by electrical means, but at the cost of increased weight and space, together with some loss of efficiency.

The advantage in economy is relatively unimportant in men-of-war at full speed, save in so far as the weight and size of the machinery is thereby affected. Low fuel consumption is, however, of considerable consequence under cruising conditions for the reasons already stated,

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and unfortunately it is in this very region that high pressures react unfavourably as regards economy. Column D has been added to Table I to show the effect of raising the steam conditions to 500 lb./in.^{2} and 750° F. The vessel in question is contemporary with that referred to in Column A. It appears probable that for the majority of naval purposes steam pressures will not be raised appreciably above their present level, while the temperature of the steam will be kept to the maximum that is compatible with reasonable boiler dimensions, that is a figure of some 700° F. in current designs.

Materials.

The demands of the aircraft industry for reduced weight have led to the development of a very large number of special alloy steels and of light-weight alloys, mainly containing aluminium. The latter has been used to a limited degree in naval machinery installations, but generally for parts of minor importance, as their physical characteristics are unsuited to other applications in this service. The alloy steels, while invaluable for the production of relatively small parts such as are used in aircraft engines, cannot as yet be considered reliable in large masses; for this reason little advantage can be taken of their potentialities for weight-saving in the main engines of steam-driven vessels.

The advances in steam temperature and also the necessity for supporting superheaters in highly heated parts of the boilers have, however, called for special materials to withstand these conditions. This has been satisfactorily met by various forms of stainless and heat-resisting steels. New alloys are continually appearing in this particular field, in which finality has by no means yet been reached. Cast steel has been extensively employed to replace parts hitherto made of cast iron, solely with a view to saving weight; but owing to the inherent difficulties in producing sound steel castings, it is doubtful whether this particular object has been achieved. There is in consequence a tendency to make use of modern developments in welding, and bed-plates, etc., are being fabricated from sheet steel and angles by this means to an increasing degree with considerable saving in weight. The use of superheated steam has, however, necessitated the substitution of steel for cast iron in the more highly heated parts of the main turbines, and the difficulties encountered with steel castings have led to many delays in this connection. The non-destructive examination of castings by means of X-rays, radium and by magnetic tests have been greatly developed on this account, while the welding torch has been increasingly employed for repairing minor defects. Many special materials are being used to meet the somewhat arduous requirements for turbine blading, but the process of development is still proceeding. Stainless irons and steels comprise the majority of the materials used for this service, where also Monel metal, a natural cupro nickel alloy found in Canada, has been extensively employed.

Leakage of condenser tubes has always been a troublesome

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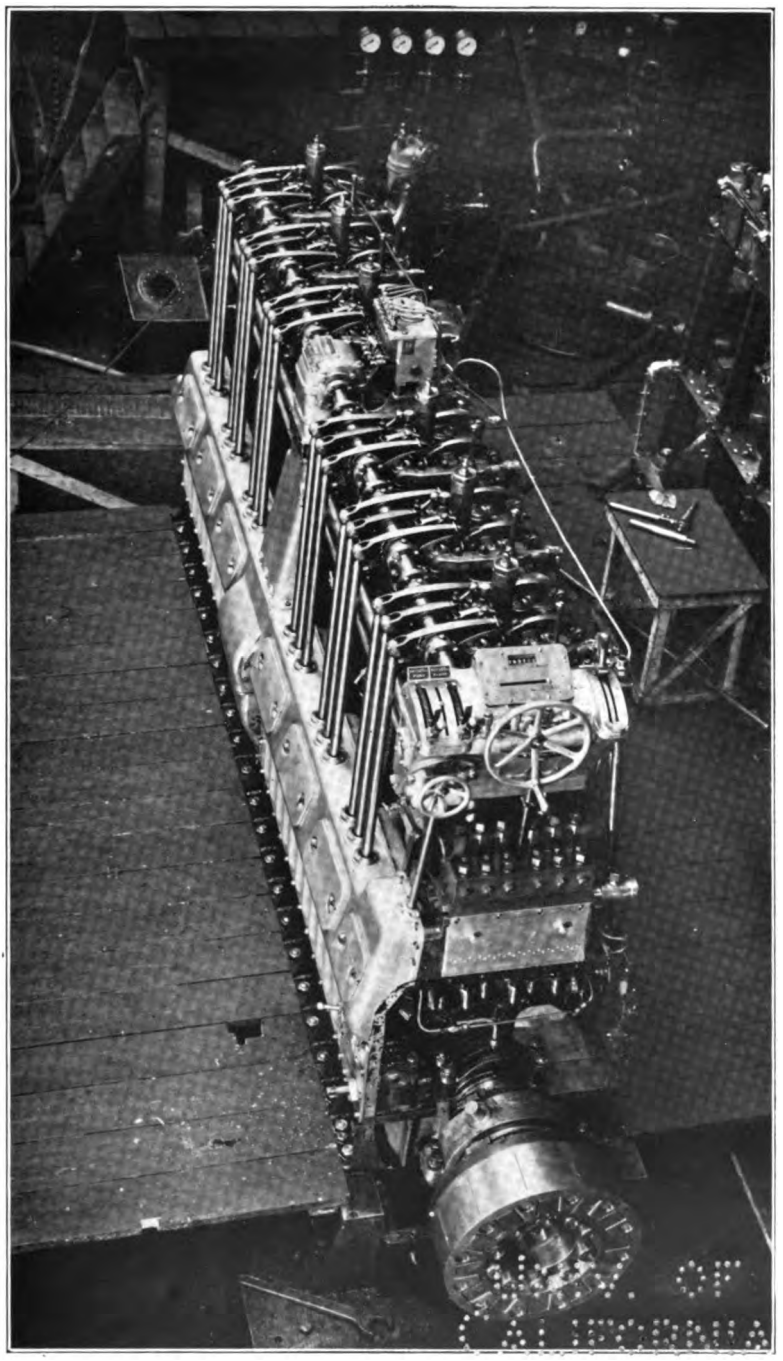

SUBMARINE MACHINERY.

Diesel Engines Building for Estonian Submarines.
(By courtesy of the builders, Vickers-Armstrongs, Ltd.)

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problem in marine work, and although very reasonable service was obtained from brass tubes made to Admiralty specifications, these have never been entirely free from inexplicable failures. In consequence a research was initiated soon after the war, and as a result cupro nickel tubes (70 per cent. copper, 30 per cent. nickel) have become standard in men-of-war built since 1929. The results obtained with this expensive material have been very satisfactory, but it is hoped that tubes made of aluminium copper, a further suggestion of the Corrosion Research Committee, may prove equally resistant to all forms of corrosion, with a very desirable decrease in cost.

The only other development of interest in the material field has been the supersession of expansion glands by corrugated steam pipes as a means of allowing for expansion. A specialised process is carried out by Messrs. Aiton of Derby, and has proved a very satisfactory solution to this problem.

THE INTERNAL COMBUSTION ENGINE.

Despite the vast increase in the use of internal combustion engines for land and air services during recent years, it has not yet proved practicable to employ engines of this type for the propulsion of high-powered warships without prejudicing their military characteristics. It has of course long been the dream of inventors to produce internal combustion turbines, but while the metallurgical developments of the post-war years have almost entirely overcome the difficulties of obtaining material to withstand the high temperatures associated with such engines, there still remains the apparently insurmountable obstacle of producing economically the large quantities of high-pressure air that would be required. A turbine of this type, with an economy about equivalent to that of a non-condensing steam reciprocating engine, is perhaps a feasible proposition at the present time, but such a design could not be seriously considered for naval purposes.

If the heavy-oil engine is to compete with existing steam designs in weight and space, machinery of the fast-running type such as that used in submarines will be essential. In these highly forced units the rapid cyclic changes in temperature and stress react unfavourably on durability and reliability, the two primary requirements for warship machinery. The standard achieved by modern high-speed Diesel engines in this respect is still below that desired, and outweighs decidedly the sole advantages of the internal combustion engine, namely economy and more immediate availability for use. Marked advances have, however, been made in the heavy-oil engine for use in submarines, and the work carried out at the Admiralty Engineering Laboratory, instituted in 1917, has enabled mean indicated pressures up to 135 lb. per sq. in. to be developed at speeds of about 400 r.p.m. The attainment of such high pressures in a high-speed engine produced its own peculiar problems, and although the major difficulties have been overcome it must be

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appreciated that reliability is, at all events in the early stages, prejudiced by such advanced performances.

Advantage has been taken of the development of small, very high-speed Diesel engines for shore services (motor buses, etc.), to employ such units for driving small electric generators in destroyers and also for use in motor boats. As must be expected, these designs when translated out of their original sphere have given rise to various problems. The difficulties have, however, now been largely overcome and engines of this type are well established for generating purposes in small vessels.

The recent extensions of the storage of petrol in all those classes of warships which now carry aeroplanes has largely discounted the chief objection to the use of this fuel in motor boats. In view therefore of the greater reliability of the petrol engine compared with the, at present, less highly developed high-speed Diesel engine, there has been a change in policy governing boats' engines. Provision is being made for the supply of fast petrol-driven boats, the Diesel being reserved for craft of the larger and slower types. The production of a satisfactory light high-speed Diesel engine may, however, produce once again some change in this respect.

CONCLUSION.

The combined effects of the evolutionary developments of the post-war years are illustrated by the comparisons given in Table II. These do not, however, by any means give the whole of the picture, for the modern types of machinery, both main and auxiliary, together with improved lay-out and controls, have greatly facilitated the readiness with which large changes in power can be made. Thus, even in a large vessel full power can be safely developed within 15 minutes of steaming at slow speed, instead of an hour or more being expended on the process. The large, slow-speed propellers have also contributed to more rapid acceleration and more effective astern power, two factors of considerable importance when manœuvring in confined waters. Further, the larger output boiler units made possible by the use of oil fuel and by higher rates of forcing have greatly reduced the boiler-room personnel, while that required for the machinery spaces has also been curtailed by the elimination of reciprocating engines, for both main and auxiliary purposes. The modern tendency is undoubtedly towards automatic or semi-automatic operation where this desirable end can be obtained without the use of complicated or delicate apparatus, as by these means rapidity and certainty of operation may be improved while the strain on the personnel can be greatly minimised. Reductions in the engine-room complement cannot, however, be made as the result of such developments, since already the size of the staff is determined more from considerations of maintenance than from those of operational requirements.

In conclusion, it may be stated with some confidence that developments during the next few years are likely to be along present lines,

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TABLE II.

Ship.	Year of Design.	No. of Shafts.	Engines.			Boilers.			Machinery.		Fuel Consumption. lb. per h.p. hr.
			Type.	S.H.P.	R.P.M.	Type.	Steam Press. lbs./sq. in.	Steam Temp. °F.	Wt. per lb. h.p.	Floor. Space s.f. per h.p.	
Lion . . .	1909	4	Turbines; series; direct drive	70,000	275	Yarrow, large tube.	235	Saturated Steam	154·0	0·25	1·67
Cleopatra . .	1913	4	Turbines; independent; direct drive	40,000	590	Yarrow, small tube (oil fuel)	235		48·4	0·12	1·33
Repulse . .	1914	4	Turbines; series; direct drive	112,000	275	Babcock and Wilcox (oil fuel)	235		113·0	0·166	1·28
Furious . .	1915	4	Turbines; geared drive	90,000	320	Yarrow, small tube (oil fuel)	235		66·5	0·128	1·03
Hawkins . .	1916	4	Turbines; geared drive	60,000	420	Yarrow, small tube (8 oil fuel, 4 oil and coal)	235		71·2	0·158	1·26
Hood . . .	1916	4	Turbines; geared drive	144,000	210	Yarrow, small tube (oil fuel)	235		84·0	0·136	1·11
Delhi . . .	1917	2	Turbines; geared drive	40,000	275	Yarrow, small tube (oil fuel)	235		53·5	0·132	1·15
Enterprise .	1920	4	Turbines; geared drive	80,000	350	Yarrow, small tube (oil fuel)	250		44·0	0·108	1·17
Berwick . .	1925	4	Turbines; geared drive	80,000	300	Three-drum, small tube, with superheaters (oil fuel)	250	550° F.	45·5	0·118	0·89
Sussex . . .	1926	4	Turbines; geared drive	80,000	300	Ditto	250	550° F.	45·5	0·118	0·872
Leander . .	1930	4	Turbines; geared drive	72,000	300	Small tube (oil fuel)	300	600° F.	45.0	0·109	0·824

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with moderate increases in the pressure and temperature of the steam in certain classes of vessels. The possibilities of forced circulation boilers will no doubt be explored, but no immediate general change of so fundamental a nature is to be expected. Improved operation is likely to be obtained by semi-automatic means, and also possibly by reversion to the principle of driving some of the more important auxiliaries directly from the main engines, a feature that may possess advantages both in economy and maintenance.

J. B. S.

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CHAPTER IX.

The Merchant Navy as a Factor in Imperial Defence.

The Merchant Navy is a service as well as an industry, and its importance in war time is so great that no commercial policy should be adopted without the fullest consideration of the needs of Imperial and national defence. Most great Powers have long recognised this, and have increased the strength of their Merchant Navies by protection, reservation of valuable trades and large building and running subsidies, none of which measures can be justified economically. Yet in spite of our Imperial and national needs being so very great, and the fact that we support a population which cannot even be fed without overseas transport, the official attitude—it can hardly be termed policy—towards our Mercantile Marine has been strictly commercial; indeed, it cannot even be justified commercially.

Those who for many years have criticised the Government on this point were gratified by the passage in King Edward VIII's speech at the opening of Parliament in which it was stated that the Government "was deciding what measures are required to secure the maintenance of a Mercantile Marine adequate for the needs of the country." Nevertheless, such an assurance would have been more timely four or five years ago, as unfortunately it is now no longer a matter merely of maintaining the Merchant Navy, but of building it up and of providing an adequate supply of cargo-carrying ships. Does this mean that the British Mercantile Marine requires large subsidies to enable it to regain its lost ground? In the initial stages, the answer is undoubtedly "Yes"; and more and more public money must be earmarked for this purpose until such time as the Merchant Navy is once more in a position to earn sufficient income to offset the losses and short-earned depreciation since 1929.

The present sharp rise in freights has made shipping a profitable venture once more, but the profits are not confined to British shipping. The British shipowner must set aside most of his profits to make good past losses and the depreciation for which no provision could be made during recent years; but many of his competitors are able to set them aside in preparation for the fight which will once more be renewed when the inevitable fall in freights takes place. The history of the last thirty years will once again be repeated. Unprotected British shipping will emerge from that slump far weaker than when it entered it, and its competitors will have absorbed more British ships and more British trade.

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This chapter is confined solely to the British cargo-carrying fleet, in which term are included tramps, cargo liners and passenger liners with appreciable cargo space. It is by cargo ships alone that the population of this country can be fed, and they must bring in the enormous quantity of raw materials essential to the successful prosecution of war. To-day the cargo fleet is utterly inadequate for the responsibilities it would be called upon to shoulder in war time, when the necessity for adequate communications and transport ranks above any other.

It might be thought that, as we now have over 1,000 less cargo ships than in 1914, this fact was self-evident; but that is apparently not the view of the Government. Two years ago, the tramp section of the Merchant Navy asked for a subsidy to enable it to carry on. Two million pounds were granted, and simultaneously the President of the Board of Trade produced his "Scrap-and-Build Scheme." Under this, to qualify for Government financial help in building cargo ships, two tons must be scrapped for every new ton constructed. In other words, it was evidently thought advisable to reduce the number of our cargo vessels drastically, and in spite of experience in the War it must have been supposed that the remaining "pocket" fleet would somehow or other prove sufficient. It therefore seems advisable to attempt an estimate of the size of our Merchant Navy necessary to make it self-sufficient and capable of fulfilling its duties as a vital factor in national and Imperial defence.

It is estimated that, allowing an average of three "round trips" a year for the various classes of cargo ships under the British flag, cargo space equivalent to 52 million deadweight tons' capacity is available to carry our annual requirements of 50 million tons of food and raw materials. Superficially, this may seem sufficient, but allowances have to be made for a number of factors :—

First of all, bunker space must be reserved, and an average of 10 per cent. is a reasonable minimum. This, translated into deadweight tons, gives an immediate shortage of 3 million tons, or 150 ships.

Secondly, the provision of adequate bunker supplies throughout the world must be organised. The experience of the last War showed that some extra ships have to be detailed for this work, and allowing a minimum of 60 vessels, the total shortage becomes 210 ships.

Then nearly half of the Merchant Navy, including one-third of the cargo ships, burns oil fuel, and it is almost impossible to estimate what provision will be made for their supplies. The British tanker fleet can carry sufficient for the Royal Navy, but there will be little left over for the other fighting services, quite apart from the needs of road transport and power stations. Presumably, neutral tonnage is to be relied upon to fulfil these requirements, and provision will have to be made to supply our cargo vessels. The position would be desperate indeed if our oil-burning merchant ships proved useless owing to lack of fuel.

The next factor to consider is the measure of success likely to be achieved by enemy commerce raiders at the beginning of a

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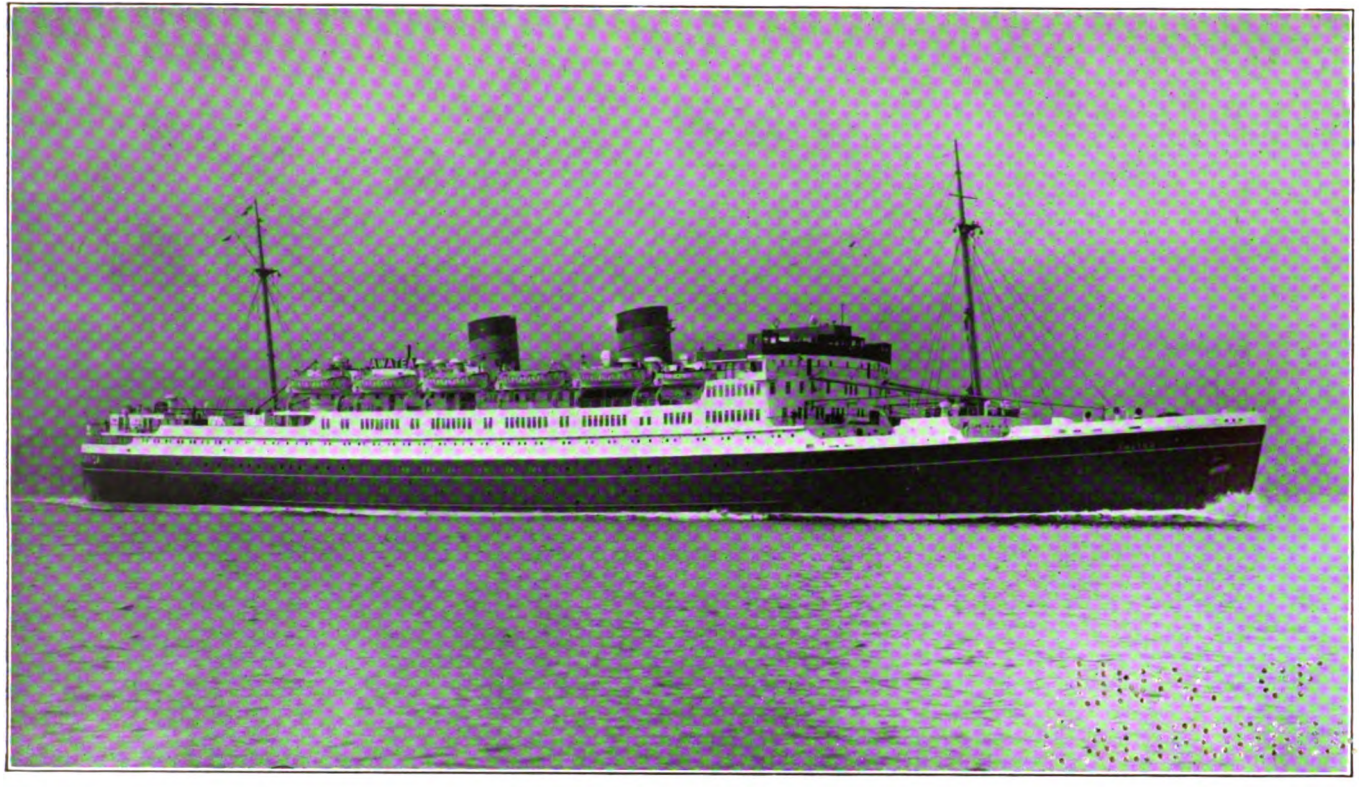

THE NEW LINER AWATEA.

Built at Barrow for the Union Steamship Company of New Zealand.
(By courtesy of the builders, Vickers-Armstrongs, Ltd.)

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war, during the period when the Royal Navy is gaining control of the situation and perfecting its war organisation. This may take about three months, and it would be surprising if less than 50 ships were lost before they could assemble for protection by the Royal Navy. This brings the shortage up to 260 ships.

Here I should like to cite a concrete example of the equipment of a first-class Power to carry out commerce raiding, should the need arise, and one which will serve to show how far we are behind others in our defence preparations. The Japanese are constructing a series of 20-knot, 10,000-ton deadweight, oil tankers. From a commercial point of view, these ships cannot be justified. The highest economic speed for a modern tanker is 12 knots, but the extra 8 knots would, obviously, be invaluable in war time. It would be possible to organise a striking force of warships, incorporating the 20-knot tankers, which could steam with the fleet and make it independent of bunker ports. On the other hand, these tankers might themselves be utilised as commerce raiders, and by burning the fuel carried in their 10,000-ton capacity they could steam round the world, independent of any port of call, and, indeed, untraceable by ordinary naval standards.

Further allowance must be made for submarine activity. Although anti-submarine devices have greatly improved, some measure of success is likely to be achieved, and surely it would be no overstatement of the case to allow 50 ships being lost from this quarter. The shortage is now 310 ships.

It is pure conjecture to estimate what the casualties may be from enemy aircraft, but the bulk of our grain and cargo discharging facilities are situated on the East Coast, and to reach them merchant ships would be extremely vulnerable to attack from the Continent. The losses might be as high as 150 vessels in the first year. This brings the shortage up to 460 ships.

What is perhaps the greatest danger to our food supplies is damage to ports by air attack. If the grain-discharging facilities of the Port of London were put out of action, incalculable delay would be involved in landing cargoes at other ports in the country. Such a dislocation would create an immediate need for at least 200 more ships.

The last point I have to make is that, as it stands to-day, the British Merchant Navy is not a balanced fleet. It has been driven by foreign competition from the smaller type of ship into the larger one. As an example, British ships are, for the most part, too large to enter into the grain trade from the Danube. During a war, we could not supplement our grain supplies from this area without utilising some foreign ships for their transport.

In view of all these circumstances, the final estimate of the shortage in our cargo-carrying fleet is approximately 700 ships. This is unquestionably optimistic, and some shipowners would allow 1,000, even 1,500, as being nearer the figure.

It is obvious, therefore, that if the Merchant Navy is to be of any value as a defence factor it must be considerably increased and strengthened. It is suggested that the first step in its reorganisation

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programme should be the appointment of a Minister of Marine, holding rank equal to that of the heads of the other defence services, for in war the responsibilities of the Merchant Navy are equally heavy, and its casualties may well be proportionately high. The present arrangement whereby shipping comes under the ostensible jurisdiction of the President of the Board of Trade is unsatisfactory. Under the care of this one minister are coal, iron and steel, cotton, jute, patent medicines and optical instruments—the list could be continued indefinitely—besides commercial treaties. Shipping is out of place amongst these, and cannot be receiving its due amount of attention.

It should be realised, moreover, that shipping is not even solely under the Board of Trade; other Ministries have fingers in the pie. Shipowners condemn the Board of Trade for not insisting on their rights under the Merchant Shipping Act to take entire control of the industry's relationship with the Government. For when a ship is in port she becomes a "factory," and, in certain matters, is under the technical jurisdiction of the Home Office! The Ministry of Health, the Ministry of Labour and the Ministry of Agriculture and Fisheries also have certain responsibilities. This multiplicity has certainly not assisted, to say the least of it, the efficiency of the industry.

The second step in the programme is to provide more ships and regain the ground which has been lost. We must build up our fleet and meanwhile take steps to secure its rightful employment. To do this, the "Scrap-and-Build Scheme" should be extended in scope, so that one new ton is built for every old ton scrapped, and it must be made retrospective. Since 1929 scores of ships have been scrapped without replacement, and under the Government scheme only one has been built in place of two scrapped after 1934. This has not only led to a reduction in ships, but has created serious difficulties in personnel, as no one cares to choose as a career an industry in which employment is steadily contracting. It is now admitted both by the Ministry of Labour and the Board of Trade that a very serious shortage of efficient deck hands already exists; bo'suns and junior engineers are almost unobtainable. In the event of war, the Royal Navy will call for some thousands of men from the Merchant Navy, but unless the present situation changes there will be no men available.

If we build ships, we must find some means of employing them. It is acknowledged that there are more ships on the seas to-day than there are cargoes in the world to fill them. The increase, however, is not in British ships, for while our competitors have steadily consolidated their gains, we have steadily retreated, and there has been actually a large decrease in British cargo ships. It is, therefore, high time that we insisted on a more equitable share of British purchases being carried in British vessels. The Board of Trade's statistics prove that Denmark, Finland, Germany, Norway, Poland, Russia and Sweden had an adverse trade balance for the first quarter of 1936 of two to one against us. The amount of trade between Great Britain and these countries is large, and although we sold to

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them only half as much as we bought from them, yet their ships carried twice as much of the trade, and outsiders actually transported 12·9 per cent.

This disclosure naturally leads to criticism of the trade agreements hitherto concluded, in which no safeguard for British shipping has appeared. There seems to be no commercial reason why countries which cannot balance their trade with us should not be required to employ British ships to reduce the difference. In making such stipulations, discrimination should be used between nations like the Norwegians, whom we regard as close friends, and others whose good will is, to say the least of it, less obvious.

The revision of trade agreements and the diversion of more British purchases into British ships will take time, and the Merchant Navy cannot wait while diplomats negotiate and international lawyers argue. The only immediate policy available is to match foreign subsidy with subsidy, pound for pound, foreign reservations with Imperial trade reservation, and foreign discrimination with like discrimination. New Zealand and Australia have shown us the way in the Pacific by deciding to preserve the inter-Dominion communications and reimposing the principles of our old Navigation Acts.

It is submitted that there is to-day an unanswerable case for the urgent and earnest attention of the Government if the Merchant Navy is to fulfil its function in the Empire's commercial, economic and naval line of defence.

E. H. Watts.

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NAVAL AIR
SECTION

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CHAPTER X.

British Naval Air Progress.

I. POLICY.

Many aspects of the development of British naval air work could be discussed under the heading of Policy. The first which naturally occurs to the mind is that of the organisation under which the units work which are employed on naval air duties. It is no secret that differences of opinion which can be described only as acute exist between the Navy and the Air Force on this subject. Neither the Admiralty nor the Air Ministry, of course, has ever taken any public part in the controversy; it has been carried on, often with acerbity, by their self-appointed champions in Parliament and in the Press. The acerbity is out of place and contributes nothing to the solution of a very difficult problem. But no good purpose can be served by burking reasonable discussion of the problem, and it would therefore be merely emulating the ostrich to write on "policy" governing the development of naval air work without mentioning this controversy. It is no part of the writer's intention to take sides in it, but merely, at the present stage, to give a very condensed account, as fair and impartial as in him lies, of the matters at issue.

They can be stated very briefly. The Air Force view is that, since the Air Force exists as an independent Fighting Service, it should naturally and logically supply all the flying services needed by the other two Fighting Services; that it would be not only illogical but also militarily unsound for the Navy—or the Army—to run its own Air Arm. That action would lead to confusion, duplication and waste of resources. It is conceded that where air forces are taking a part in military operations by land or naval operations by sea, they must come under the operational control of the general or admiral in command. But it is maintained that there is no essential difference between the duties of air forces in one case or the other; that the training for those duties, and the allocation of air forces to or between them, is the function of the Air Staff. This view held the field completely in the early years after the War.

The outcome, however, soon proved disquieting to the Navy, to whom after the War the importance of aircraft in naval operations was brought home by the advent of the aircraft carrier; for that development made aircraft available to a fleet at all times instead of only, as formerly, when it happened to be within aircraft range of a shore aerodrome. It was represented by the Admiralty that the

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Air Force, pre-occupied no doubt with its responsibilities for Home Defence, had not found itself able to spare to the Fleet the air forces needed, in the Admiralty view, for naval efficiency; and did not appear fully to appreciate naval needs in that respect. In order to meet those representations, the present organisation under which the Fleet Air Arm works was evolved.

Under it, the Navy states its requirements of ship-borne air forces to the Air Ministry, and pays for them by a "Grant-in-Aid" from Navy votes; and it supplies up to 70 per cent. of the pilots needed, and all the observers, from naval personnel. The Air Ministry supply the Admiralty's requirements thus stated; but in order not to surrender the principles outlined above it insists upon retaining a measure of administrative control over the embarked air forces, and upon the naval pilots for that purpose being granted rank as officers of the Royal Air Force in addition to their naval rank. This system, it is maintained (as, for instance, by Lord Trenchard in a letter to *The Times* of November 23, 1936), gives the Navy, which has full operational control of all air forces embarked in H.M. Ships, all that it can reasonably need.

Lord Trenchard's view, however, finds no support in the Navy, for it ignores other points at issue, one of which seems to be fundamental. Naval officers hold, as the result of many years' experience of the working of the Fleet Air Arm, that prolonged sea experience and training is necessary to an airman to fit him for co-operation with naval forces, or indeed to carry out, independently of naval forces or in substitution for them, the sea duties that arise in War. The minimum period necessary was stated, by the Naval Correspondent of *The Times* in a letter which followed that of Lord Trenchard, as three years. The Royal Air Force, on the other hand, it was stated by their representative in Parliament, do not admit the necessity for any such specialisation; they regard any combatant duty that may fall to an airman as fully within the competence of the trained officer of the R.A.F. The Air Ministry, therefore, intentionally brings about a constant exchange of pilots between units allocated to different duties; and in consequence the average time actually served in the Fleet Air Arm by officers of the R.A.F. has been less than two years.

This fundamental difference of view upon the qualifications needed for air work at sea not only affects the Fleet Air Arm, which consists only of embarked air forces, but it also reacts upon the whole system of Imperial Defence. For naval forces operating in narrow seas obviously need the co-operation of air forces just as much as the more mobile fleets; and the former's need must obviously be supplied by shore-based aircraft, since it would be neither economical nor efficient to use carrier-borne aircraft for the purpose. In the naval view, the naval co-operation of these shore-based forces is just as much a whole-time job as is that for the Fleet Air Arm, and needs just as much sea training and experience; moreover, essential operations of the narrow seas, such as convoy or anti-submarine work, cannot be adequately carried out unless the necessary air forces are available, nor can proper defence measures be organised if

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their availability is in doubt. The Air Force view, however, rejects the necessity for whole-time specialisation, and holds that forces trained for ordinary duties should be fully efficient when called upon to operate at sea ; it maintains that they may or may not be needed for work at sea, and therefore should not be allocated beforehand. For this reason, it would obviously be unsound and uneconomical to maintain a special branch of the shore-based air forces for naval co-operation, trained for that duty to the exclusion of others. Units of the general Air Force will be detached for naval co-operation as and when they are needed ; and the judge of when they are needed and when they can be spared must, of course, be the Air Staff.

Thus the issue is joined. Since the Navy finds that the system of dual control of the Fleet Air Arm—*i.e.*, the embarked sea-air forces —is cumbrous and unsatisfactory ; that it is unpopular with the personnel of both services to the point of making it difficult, if not impossible, to keep the Fleet Air Arm up to strength ; and that it has failed to achieve the same progress in sea-air work as has been made in other navies, with the result that the British Navy has been surpassed by others in that respect ; the Navy's advocates press for the abolition of the dual system and for the allocation to the Admiralty of full responsibility for, and control over, the embarked air units together with those shore aerodromes which are essential to their working. Moreover, in the matter of shore-based air forces for naval co-operation, strict adherence to the Air Force attitude outlined above means that naval forces in narrow seas may at any moment find themselves deprived of essential air co-operation upon which their ability to discharge their special responsibilities may well depend. Naval partisans, in Parliament and the Press, have thus been driven to press for full naval control also of all shore-based air units needed for operations at sea, as the only means of guarding against that danger. Air Force partisans, on the other hand—*e.g.*, Lord Trenchard in the letter quoted—seem inclined to pooh-pooh the naval objections to the present régime, and advocate its maintenance without change.

There, at the time of writing, the matter rests. The writer cannot, of course, claim complete disinterest and impartiality, but he would submit, to those who can, that it cannot be allowed to remain there. The very existence of the controversy is evidence of a lack of co-ordination between two of the three Defence Services, which has got to be made good. That consideration disposes of Lord Trenchard's contention that all is well with the present régime. But equally, considerations of possibility dispose of the opposite proposal to transfer to the Navy the responsibility for all aircraft, whether embarked or shore-based, which will take part in naval operations. There is nothing to be said for the maintenance of the dual system in the Fleet Air Arm ; but equally, if the Air Staff were to admit that a quota of fully sea-trained shore-based aircraft is indispensable to the discharge of naval responsibilities in narrow seas, and would undertake to provide it, there would be no adequate ground for the naval demand for full administrative control of all such units. The true solution of the problem lies in the adoption of a

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policy lying somewhere between the extremes advocated on the one hand by Lord Trenchard and on the other by Sir Roger Keyes; and it should not be difficult to reach it if the disputants could discard prejudices and each endeavour to understand the other's case.

It will probably be generally agreed by all, whether they are partisans in this controversy or impartial outsiders, that a decision on this major question of policy cannot be much longer delayed. The appointment by the Government of a Minister for the Co-ordination of Defence is evidence that the vital necessity for co-ordination of the Fighting Services is recognised, and it cannot be considered as achieved while two of them are at variance upon a primary aspect of the problem of Imperial Defence. Moreover, co-operation between the services is essential in any department of Imperial Defence in which more than one is employed. The spirit of partnership has, all observers are agreed, been manifested wherever units of the two services have been working together, despite the difficulties of the system under which they are organised. All that now seems to be required is that that same spirit of partnership, of willingness to hear, to discuss and to understand the other parties' point of view, should be extended to embrace all points, including the highest, at which the Services come into contact.

Aircraft Carriers or Catapults.

Many minor points of the policy governing the development of naval air work occur to the student of naval affairs. There is the question whether, in strengthening the air element of the fleet, preference should go to carrier-borne aircraft or to those which are carried in fighting ships. The aircraft carrier is the most vulnerable of ships. Her armament is negligible, except against torpedo craft, and she is likely to fall a victim to the smallest enemy cruiser that may succeed in getting within range of her. She is yet more vulnerable to bombs from the air, even quite small bombs which would have little effect on any fighting ship; for though they could not inflict damage serious enough to endanger the ship, they could so damage the flight deck as to make impossible the operation of aircraft. Besides being very vulnerable, the aircraft carrier is very costly. She must be of high speed, not only for operating aircraft, but because her only defence against a man-of-war is retreat.

Against all these disadvantages must be put the enormous advantage that, from the air point of view, the carrier is economical of resources; for she enables aircraft to operate continuously. Planes can return to the carrier at any time, to recharge with fuel or armament, and return at once to the attack, to the search or to the patrol. The operation of aircraft from carriers entails no interruption in the operations of any other naval unit, and—an important point—the carrier, fitted specially for communication with planes, can act as a centre of communications for large numbers of aircraft in flight at once.

The equipment of fighting ships with aircraft entails reserving

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for them the weight and space needed for stowage, catapult and cranes. The last-named, perhaps, need involve no sacrifice, for every ship must possess apparatus for lifting her boats, and it would not seem to need very great ingenuity to arrange for dual purpose equipment. Once the aircraft are launched, however, the weight and space allotted to them and the catapult are, from the fighting point of view, wasted. The re-embarkation of aircraft after a ship is in action will be out of the question in nine cases out of ten; for it seems unlikely that a naval action, even if only a minor one, will be decided within the flying endurance of her plane.

Catapult aircraft in fighting ships are thus "one-flight" aircraft on active service. It requires a nice judgment to decide the moment at which they must be flown off. If not soon enough, they will not justify their existence; if too soon, they will exhaust their endurance before performing any useful function. On the other hand, in the case of a fleet action it may well happen that all the carriers will have been put out of action—or at least rendered incapable of operating aircraft—before action is joined between fleets. If so, the catapult aircraft may be the only ones available to assist the gunnery of the fleet. In most naval battles in history, one side has been anxious to join action, the other to avoid it, and the problem of the former has been how to "fix" his opponent. Aircraft, which enable a fleet to engage an enemy before sighting him, may well prove the only solution of that problem; and if the equipment of fighting ships with catapult aircraft provides them at the critical moment, the sacrifice of fighting power in order that they may be carried will be fully justified.

Fleet actions, however, are not the only, or even the most frequent, occasions for the operations of men-of-war. Cruisers operate detached, and in small squadrons, more often than in fleets, and the only aircraft available to them there—if they are outside the radius of shore-based craft—are those they themselves carry.

There is thus no decision between carriers and catapults—so far as they may be considered alternatives. This is reflected in the policy which is being adopted by the Admiralty in the expansion of the fleet. Three new carriers are already in hand, and two more are to be ordered; but every new cruiser or capital ship to be built carries aircraft, and the older ships as they are modernised are fitted to carry many more aircraft than before.

Reconnaissance or Attack.

Which is the more important function of aircraft in naval operations, reconnaissance or attack? If that question can be answered with confidence, is either so important that it ought to be provided to the exclusion of the other? These are questions of policy which govern the type of aircraft with which the fleet is to be equipped. So far as fighting ships are concerned there is, of course, no doubt of the answer to the question above; they derive

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directly from consideration of the fighting power of the ship herself and the aircraft she can carry respectively.

The man-of-war is capable of destroying a similar enemy ship by the use of the weapons with which she is equipped—guns and torpedoes; a ship-borne aircraft is not. Thus the ship-borne aircraft's role is to assist the man-of-war in which it is carried, by reconnaissance, in bringing her opponent to action, and by spotting, to add to the efficacy of gunfire. It would be a waste of the fighting ship's resources to equip her with bombing or torpedo-carrying planes, since the armament of such aircraft would not be an adequate substitute for the ship's armament that must be sacrified in order to carry them.

This argument, however, does not hold good if extended from the single ship to the fleet; for the fleet may comprise aircraft carriers. Aircraft carriers are capable of providing a force of torpedo-carrying or bombing planes which are capable of inflicting an appreciable measure of damage on an enemy ship—not comparable, of course, with the offensive power of the fleet as a whole, but by no means negligible. The role of the carrier-borne aircraft is still to assist the fleet, not to replace it. This they can do, as do catapult aircraft, by reconnaissance and by spotting; but they can also, in certain circumstances, assist it by direct offensive action better than by either.

It has been mentioned above that one of the chief difficulties of a fleet in war is to bring an unwilling opponent to action. Air reconnaissance may assist the fleet which is seeking a decision to locate the enemy who is seeking evasion; but it also assists the latter by enabling him to retire before actual contact is made. The pursuer's offensive aircraft may then come into their own, and they are, indeed, the only weapon which can be effective. Their torpedoes and bombs are unlikely, perhaps, to destroy any of the retiring fleet, but they may well inflict enough damage to reduce the speed of some ships. The unwilling fleet must then either abandon its damaged ships to destruction by the pursuing fleet—as Hipper abandoned the Blücher at the Dogger Bank action—or stay to support them and thus be brought to action. It would thus seem sound policy that torpedo-bombing machines should form part of the complement of a carrier's aircraft, but they should not be carried by fighting ships. This, in fact, appears to be the policy which has been adopted.

Torpedo or Bomb.

The policy governing the training given to the personnel of attack aircraft depends upon whether the torpedo or the bomb is adopted as the primary weapon. Mathematically, it should be easier to hit with a torpedo than with a bomb—that is, a larger proportion of hits should be obtained from a given number of torpedoes discharged than from the same number of bombs dropped. Moreover, damage to a ship by explosion is more effective under water than the same measure of damage to a ship's upper works; for under-water damage contributes directly to the destruction of a ship by sinking, whereas

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H.M. MINESWEEPER NIGER.

Commissioned for Service, June 4, 1936.

(By courtesy of the builders, Messrs. J. S. White and Co., Ltd., Cowes.)

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above-water damage may be very extensive without approaching the vital. So far, the advantage would seem to be all with the torpedo.

Practical considerations, however, modify this view. The weight of explosive is a small proportion only of the weight of a torpedo, so that the torpedo-carrying plane must be capable of lifting considerable weight, only a small part of which can be effective. The torpedo is an intricate and somewhat delicate piece of mechanism, which needs constant skilled maintenance, and careful adjustment, if it is to work reliably. Torpedoes are understood to run erratically, or even fail to run, not infrequently, particularly if the conditions of discharge are at all exacting, as they may well be when they are dropped from aeroplanes at high speed and from varying heights. The approach of a torpedo-carrying plane to its target is such as to offer easy conditions for anti-aircraft fire. Modern capital ships are so well protected against under-water explosion that it seems unlikely that the torpedoes carried by aeroplanes can hope to inflict damage commensurate with the effort and resources expended on them. All these factors may well operate to cancel, or more than cancel, the inherent advantages of the torpedo over the bomb first noted. The decision presumably depends largely upon the degree of technical efficiency which it is found possible to achieve with one weapon or the other. That, no doubt, varies in different navies, and is not likely to be known outside them.

It has been claimed that the method of "dive-bombing" adds so greatly to the accuracy achievable as to enhance enormously the power of the bomb weapon. The soundness of the claim may be doubted. Certainly more hits should be made by dive-bombing—in which the pilot uses no sight, but dives directly at his target at full throttle and releases his bomb just before pulling out of his dive—than by level bombing, which depends for its success upon the accuracy with which all the elements of the problem can be observed or calculated and set upon the bomb sight. Moreover, an aeroplane diving at a ship should have little or nothing to fear from anti-aircraft fire. But the dive-bomber can get but little velocity on his missile, which will therefore not achieve penetration of a modern well-protected ship such as is to be expected from heavy bombs dropped from 8,000 to 10,000 feet, a height from which not many hits can be expected. This is probably yet another of the problems upon which we may speculate in time of peace, but to which the actual experience of war can alone bring a solution.

Flying-Boats or Wheeled Aircraft.

The last question of policy which it is proposed to discuss here is that of whether future development of aircraft for use at sea is to be sought in flying-boats or in wheeled aircraft. The performance of the former has been in the past so inferior to that of the latter as to raise no question of this sort in the early days of naval aircraft. That fact, perhaps, has been the reason why for so many years the flying-boat, of which the great naval utility would seem to the lay-

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man to be obvious, has been the neglected Cinderella of flying services. Another reason, of course, is to be found in the fact that the Navy, to which the development of flying-boats would have been of such value, was never allowed any say in the matter, or even consulted on it. However that may be, the pendulum seems now to be swinging in the opposite direction. An exposition will be found in a later chapter of the reasons why commercial air services are now turning to the flying-boat and away from wheeled aircraft. These reasons may well operate in due course to produce the same effect in the Fighting Services; and if so, the fleet of the not far distant future may well comprise, as a matter of course, flotillas of flying-boats on the same footing as squadrons of cruisers or flotillas of torpedo craft.

RECENT PROGRESS IN EQUIPPING THE FLEET.

The progress made during the year has been in the direction more of re-equipping existing organisations with machines more up to date than they have hitherto had than in increasing the numbers of aircraft already afloat. This, of course, has been inevitable since the total number of embarked aircraft can be increased only as a result of three measures: providing more aircraft carriers; replacing older men-of-war which did not carry aircraft by new ships which do; and fitting catapults and stowage in older men-of-war so that they can operate aircraft.

The number of aircraft carriers cannot be rapidly increased. The Ark Royal is not due to be completed before the middle of 1938, while the Illustrious and Victorious will presumably not be available until at least a year later, possibly more. Thus the first method of increasing the numbers of naval aircraft, which is also that which has the greatest effect, cannot begin to come into operation for another year and a half. The second method is already operating, but at no great speed as yet. The new cruisers Amphion, Apollo and Penelope have joined the fleet during the year, replacing cruisers of the "D" class. The two former carry two aircraft each, and the latter one. Thus the year's output of new cruisers has increased the fleet's equipment of aircraft by five machines only; but increase by this means will be accelerated in the near future as new cruisers are completed in increasing numbers. The third method of increase is also operating; ships are being fitted with catapults, and with stowage for aircraft, as they come in hand for large repair or reconstruction. During the year the Cumberland has rejoined the fleet after large repair equipped with three aircraft, and the Repulse and Malaya with four each. Thus the increase of numbers is as yet small. The 1935 Estimates, as noted in last year's "Brassey," provided for a total of 190 aircraft; the 1936 Estimates allowed for an increase to 217, of which some 200 had been provided by the end of that year.

Re-equipment, however, has proceeded much faster. In the 1936 Navy Estimates, Vote 4, for the Fleet Air Arm, was up by

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£1,193,000 over the corresponding figure of 1935; and the 1936 Air Estimates stated of that increase that no less than £1,149,000 was to be devoted, under Vote 3, to the provision of new machines. The Fleet Air Arm naval vote was increased by another half million again by the Supplementary Estimate presented in April, 1936. The exact scope of the re-equipment thus provided for is not known, but up to the end of 1936 some 90 of the new torpedo-spotter-reconnaissance machines—the Fairey Swordfish, illustrated in the last issue of "Brassey," and the Blackburn Shark—were in service, together with some 15 Supermarine Walrus amphibians.

Fleet Air Arm Disposition.

The organisation and disposition of the Fleet Air Arm units at the end of 1936 was reported to be as follows :—

Carrier-Borne Units.

Courageous. (Flagship of the Vice-Admiral, Aircraft Carriers.)	
No. 800 Fighter Squadron	3 Osprey. 9 Nimrod.
No. 810 Torpedo Bomber Squadron	12 Shark.
No. 820 Torpedo Spotter Reconnaissance Squadron	12 Shark.
No. 821 Torpedo Spotter Reconnaissance Squadron	12 Shark.
Furious.	
No. 801 Fighter Squadron	9 Osprey.
No. 811 Torpedo Bomber Squadron	12 Swordfish.
No. 822 Torpedo Spotter Reconnaissance Squadron	12 Swordfish.
Glorious.	
No. 802 Fighter Squadron	3 Osprey. 9 Nimrod.
No. 812 Torpedo Bomber Squadron	12 Swordfish.
No. 823 Spotter Reconnaissance Squadron	12 Swordfish.
No. 825 Spotter Reconnaissance Squadron	12 Swordfish.
Hermes.	
No. 803 Fighter Squadron	6 Osprey.
No. 824 Spotter Reconnaissance Squadron	9 Seal.
To be replaced by :—	
Eagle.	
To be equipped with	18 Swordfish.

The Courageous is reckoned as a unit of the Home Fleet, but spends a certain proportion of the year in the Mediterranean. The Furious belongs to the Home Fleet, but is at present employed almost exclusively in the training of pilots in order to provide for the expansion now in progress. The Glorious is a unit of the Mediterranean Fleet, but comes under the orders of the Vice-Admiral, Aircraft Carriers, when he is on that station. The Hermes is a unit of the China Station, but is to be relieved early in 1937 by the Eagle, recently in reserve at Devonport, and will then be relegated to the reserve. The remaining aircraft carrier, the Argus, is in process of being fitted out at Devonport for training, and as a depot and operating ship for "Queen Bee" aircraft, referred to later.

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MAN-OF-WAR-BORNE UNITS.

Second Battle Squadron, Home Fleet.	
No. 702 Spotter-Reconnaissance (Catapult) Flight.	
Nelson	1 Walrus.
The Nelson, for the time being, is the only battleship of the Home Fleet to carry her aircraft.	
Second Cruiser Squadron, Home Fleet.	
No. 712 Fighter-Reconnaissance (Catapult) Squadron.	
Neptune, Orion	4 Osprey.
First Battle Squadron, Mediterranean Fleet.	
No. 701 Fighter-Reconnaissance (Catapult) Flight.	
Valiant	1 III.F.
Barham	1 Seal.
Battle Cruiser Squadron, Mediterranean Fleet.	
No. 705 Spotter-Reconnaissance (Catapult) Flight.	
Repulse	2 Shark, 2 Swordfish.
First Cruiser Squadron, Mediterranean Fleet.	
No. 711 Fighter-Reconnaissance (Catapult) Flight.	
London, Devonshire, Shropshire, Sussex	4 Walrus.
Third Cruiser Squadron, Mediterranean Fleet.	
No. 713 Fighter-Reconnaissance (Catapult) Flight.	
Arethusa, Penelope	2 Osprey.
Galatea (Flagship of Rear-Admiral Cdg. Destroyers)	1 Osprey.
Fourth Cruiser Squadron, East Indies Station.	
No. 714 Fighter-Reconnaissance (Catapult) Flight.	
Norfolk	1 Walrus.
Emerald, Enterprise	2 Osprey.
Sixth Cruiser Squadron, Africa Station.	
No. 716 Spotter-Reconnaissance (Catapult) Flight.	
Amphion	2 Osprey.
Eighth Cruiser Squadron, America and West Indies Station.	
No. 718 Fighter-Reconnaissance (Catapult) Squadron.	
York	1 Walrus.
Exeter	2 Walrus.
Ajax, Apollo	4 Osprey.
New Zealand Division of Royal Navy.	
No. 720 Spotter-Reconnaissance (Catapult) Flight.	
Achilles	1 Walrus

The organisation of these units into "flights" and "squadrons" is in many cases a matter of administration only. In squadrons of the two main fleets, the First, Second or Third Cruiser Squadrons, for instance, the fighter reconnaissance aircraft carried may, no doubt, often operate as a unit in the air under their Squadron Commander or Flight Commander. But on foreign stations, where the ships are but rarely in company, not only are the opportunities for such formation practice few and far between, but that practice bears little relation to the purpose for which the aircraft are carried. They are embarked chiefly in order to enhance the capabilities of the cruiser carrying them, to extend her vision, striking and defensive power; and their function is to co-operate with their ship rather than with other aircraft. They are, that is to say, units of the ship that carries them rather than of a "squadron" or "flight" located on that station, and it is merely misleading that the enforced use of the nomenclature of another Service, necessitated by the dualism

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under which the Fleet Air Arm is still organised, should imply the opposite.

The Navy List indicates one more " squadron " of the Fleet Air Arm, entitled the " Training Squadron," without a number. It is located at the Royal Air Force Station at Gosport. There is also " No. 1 Flying Training School," at Leuchars, Fifeshire, which is accounted a unit of the Fleet Air Arm. These two units, being permanently landed, come under no naval control at all.

NEW DEVELOPMENTS.

With the attention and resources of both Services concerned in naval air work given chiefly to the tasks of expansion and re-equipment, there has been less concentration upon new developments than of recent years. The subject has not, of course, been neglected, and new developments of a minor sort are constantly under trial and experiment in service. But obviously there have been less resources to devote to the initial stages of any new device or methods, and to experimental work in general. There are thus no major innovations or developments of the last year to report.

Autogiros.

No further trials with the Cierva autogiro aircraft have taken place at sea. The development of them for land service, however, has continued, and descriptions have appeared in the Press of some preliminary trials on shore with the latest models of the machine which, by the adoption of a variable pitch for the vanes of the rotor, is able as it were to spring straight off the ground and commence its flight without any preliminary horizontal run. The power to do that, however, does not add to its utility for naval purposes. There is no great difficulty in launching aircraft from fighting ships—it was done from both battleships and small cruisers as long ago as 1917, and since that time the development of catapults has solved nearly all of the difficulties connected with it. The warship's need, which it appeared might possibly be supplied by the autogiro, is for an aircraft which can land with certainty—the qualification is important—upon a space as confined as the free deck space that can be provided in a cruiser. It is not known whether the latest form of Cierva aircraft is a sufficient improvement over its predecessors in the direction of load-carrying to make it suitable for naval purposes. In any case, no further trials have yet taken place at sea.

It is to be hoped that the lamented death of the inventor in the accident to a Dutch air liner at Croydon on December 9, 1936, will not bring to an end development in this promising machine.

Night Flying.

Further experience of night flying at sea has been gained during the year, but no details of the progress made, or conclusions reached, in this matter have been made public. Given adequate lighting on

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the flight-deck of a carrier, there would seem to be no good reason why night landing thereon should be any more difficult than night landing on an aerodrome. But strong flood-lighting of a carrier's deck is, of course, out of the question for war purposes. It would reveal clearly both the position and the character of the ship to any enemy, surface or aerial, and would invite attack in which the ship would be at a marked disadvantage.

Strong lighting was, no doubt, essential in the early experiments in night landing on the deck at sea. It may be conjectured that, once pilots achieved a fair measure of skill and confidence in those conditions, the intensity of lighting was reduced to the minimum consistent with safety. But even at that, it seems probable that the glow from a lighted deck must show up the funnel, bridge and top-hamper of the carrier to surface craft in the vicinity, even if the deck itself were not visible to them. And, of course, a deck lighted sufficiently to be visible to the ship's own aircraft must also be apparent to any hostile aircraft in the vicinity. There has been a great development in other spheres of late years of new forms of lighting—flood-lighting, coloured light strips, etc.—and it is possible that some of these may be enlisted to help in the solution of the problems of night flying at sea. But even so it would seem that the problem has two distinct aspects. Methods, for instance, which would be quite suitable for use if no hostile aircraft, or very few, were likely to be present might be impossible where an enemy was well equipped with efficient air forces. Even so, these difficulties merely accentuate the desirability of diligent search for methods of overcoming them.

"The Queen Bee."

The "Queen Bee" wireless-controlled target aircraft is now recognised as an essential part of the fleets' equipment for training. It is, for instance, much more important to the achievement of a satisfactory standard of anti-aircraft gunnery that a real aircraft should be available as a target than it is important to the ordinary armament of ships to fire at a real ship rather than at a target. High efficiency in ordinary gunnery can be achieved, and is achieved, by ships on foreign stations never visited by the target-ship Centurion. But it is not until anti-aircraft guns fire at a real aeroplane that either the efficiency of the control arrangements is fully tested or confidence gained in the efficacy of the A.A. armament. It is for these reasons that H.M.S. Argus is being specially fitted out to operate "Queen Bees."

It is not to be imagined, of course, that either in ceiling, in speed, or in manœuvrability can the "Queen Bee" be made equal to the planes by which ships may be attacked in war. It seems improbable, for instance, that a "Queen Bee" can be made to simulate dive-bombing any more than it can simulate high-speed height bombing. But despite these short-comings—in which improvement in due course may naturally be expected—the value of the practice the device affords to the A.A. personnel and armament of the fleet is immense.

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EXERCISES.

Owing to the disorganisation of the normal peace routine of the principal fleets caused by various events in the Mediterranean, no large-scale fleet exercises were carried out during the year. The usual "routine training practices" were, of course, carried out during the cruises of the fleets. Aircraft were employed in spotting during firing practices, on reconnaissance, torpedo and bombing attack whenever opportunity offered. Many of these practices were witnessed by representatives of the Press, who were admitted to the Home Fleet during part of its exercise cruise in Scottish waters in the autumn, but no detailed account of them was made public. This was, no doubt, partly because detailed accounts of fleet tactical exercises are neither of much interest to the lay readers of the Press nor are they permitted to be made public; and partly because it is not possible adequately to describe the part taken by air units in naval exercises without access to, and comprehension of, the records of communications which passed, neither of which are, of course, available to a Press representative. Thus there is little or nothing concrete to chronicle; but the subject of exercises suggests certain general considerations which possibly govern the designing of them.

Fleet exercises in which air units take a prominent part may be divided into two classes, which may for convenience be labelled offensive and defensive. The development of air forces has given to a fleet to-day the power both to locate and to attack a hostile fleet at a much greater distance than was possible in the past. Location to-day may be achieved while hostile fleets are, perhaps, nearly 200 miles apart. Attack on hostile ships by aircraft, with torpedoes and bombs, may be made at distances of over 100 miles. This was demonstrated in the Combined Fleet Exercises of 1935, when an account appeared in *The Times* of an attack on H.M.S. Queen Elizabeth in the Atlantic, 500 miles from land and over 100 miles from the nearest enemy ship, by torpedo-carrying and bombing aircraft from H.M.S. Furious. In favourable circumstances, an enemy may be engaged by ships' gunfire, with the aid of spotting aircraft, while he is still below the horizon of the firing ships, or hidden from them by fog or haze, real or artificial. In all these respects the offensive power of a fleet to-day has been enhanced by air development. Exercises designed to develop that power, to enable the fleet to utilise it to the full, may properly be described as offensive.

But all these air developments, if they have added to the offensive power of the fleet, have done the same to potential enemies. Just as the earlier development of the submarine denied to surface ships the free use of open anchorages such as they had always formerly utilised, unless they employed special measures of reconnaissance and defence, so air development has destroyed the complete immunity from attack which fleets formerly enjoyed when inside a protected harbour—if that harbour is within air range of an enemy. That does not mean that ships cannot use such harbours at all, but

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it does mean that they must develop and practise the special measures of location and defence necessary when they do use them.

The defence of a fleet in harbour against attack from the air presents very much the same problems as does the defence of, say, London or Manchester. There is the problem of detecting the approach of attacking aircraft and locating them. There is the problem of how far this can be accomplished by ships at sea, by observation posts on land, by aircraft in the air; and in the case of the last named in cloudy weather, whether above or below the cloud layer is the best position for defending aircraft. There is the problem of illumination, and whether this is best achieved by lights in close proximity to the attackers' chief target or well removed from it. There is the problem of direct defence of the fleet itself, by anti-aircraft artillery or by other means. In the case of a fleet, there is the additional problem of how far its own resources can provide for all the needs of its defence in harbour, as revealed by the solution of the foregoing problems, or how far it must rely upon, or be provided with, additional means or methods of defence. For fleets are not confined to defended harbours at home; they have always in the past made use of other harbours, in many seas, besides the defended bases maintained for their special benefit. If their mobility is not to be seriously diminished in the future, they must diligently seek the solution of these problems. Thus it may be conjectured that many of the air exercises in which the fleet has a part are very similar to those of the Air Defence of Great Britain, with which the public is familiar through the accounts that appear in the Press.

PERSONNEL.

On March 4, 1936, Rear-Admiral N. F. Laurence, C.B., D.S.O., succeeded Vice-Admiral the Hon. Sir Alexander Ramsay, K.C.V.O., C.B., D.S.O., as Rear-Admiral, Aircraft Carriers, with his flag in the Courageous. The appointment had been made some months earlier, but the change of command was delayed owing to the emergency in the Mediterranean. Rear-Admiral Laurence was promoted to Vice-Admiral on July 12, 1936, and reappointed in the higher rank.

Officers in Carriers.

The position of Senior Fleet Air Arm Officer in an aircraft carrier, always hitherto held by a Wing Commander, R.A.F., is now for the first time held by a naval officer; Commander E. W. Anstice, R.N., who holds the R.A.F. rank of Wing Commander, was appointed to the Courageous in that capacity in June, 1936.

There are still certain anomalies, arising out of the dual organisation of the Fleet Air Arm, to be noted in the Navy List. It will there be seen that in certain cases a squadron embarked in an aircraft carrier is commanded by a Flight-Lieutenant, R.A.F., while an officer serving under him may be a Lieutenant-Commander, R.N., *i.e.*, of higher relative rank, though of course junior in the R.A.F. rank that he holds. These anomalies will not doubt disappear as the

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expansion proceeds, and the larger lists enable sufficient officers of appropriate rank to be borne for the duties for which they are needed.

Incidentally, it will be noted from the Navy List that R.A.F. officers are to be found in the carriers only—except for the Wing Commanders on the staffs of Commanders-in-Chief, who are, of course, borne in the fleet flagships. The aircraft of catapult units, which, as noted elsewhere, are split up amongst squadrons of fighting ships, are manned by naval officers of the Fleet Air Arm only.

Flying Practice by ex-Fleet Air Arm Officers.

Naval and marine officers who have qualified as pilots, and have been employed in that capacity, if they joined the Fleet Air Arm subsequently to May, 1933, are regarded as available for service in emergency in the Fleet Air Arm, even if they have reverted to general duties, until they reach the age of thirty-five or the rank of Commander. They are, therefore, required to keep in flying practice by flying a certain number of hours annually, and arrangements are made with the Air Ministry to provide facilities for this practice. Arrangements have now been made with the Air Ministry for similar practice to be available for officers, now reverted to general service, who joined the Fleet Air Arm before May, 1933—and are, therefore, not obliged to return to flying duty—if they volunteer for it. Those who do volunteer will be allowed facilities for such practice until they reach the age of thirty-five or the rank of Commander, on the understanding that, if required, they will be employed in the Fleet Air Arm in emergency.

Observers' Mates.

The introduction of the new rating of observer's mate is proving to be a useful development. Not only has it provided a new prospect of advancement for those ratings who have joined the Fleet Air Arm as air gunners, and thus encouraged volunteers for that branch, but also it will enable the proportion of officers to ratings employed in the Fleet Air Arm, unduly high at present, to be reduced when the new ratings are available in sufficient numbers. Twenty-two observers' mates had been trained by the end of 1936, and their efficiency has proved fully up to expectations. None of them, of course, has yet achieved the confirmed rate, to qualify for which they must have completed two years' acting service, and be recommended at the end of it.

Non-Officer Pilots.

A certain number of sergeant pilots, R.A.F., are employed in the Fleet Air Arm, where they are understood to have given service just as satisfactory as in other sections of the Royal Air Force. So far, however, no naval ratings have been allowed to qualify as pilots. The reason for this seeming anomaly has never been made public, but it probably, like many other anomalies, arises from the system of dual control of the Fleet Air Arm. Naval officers seem to be unanimous that the lower deck is capable of supplying many men

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who should make excellent pilots; and indeed to the layman it would appear inexplicable if that were not so, seeing that the corresponding ranks of the Royal Air Force do. The lower deck provides its proportion of officers for the Navy, and the list of qualifications a man must possess in order to be eligible for a commission is far more stringent than those needed for the air pilot. The latter, for instance, though he needs a degree of certain qualifications—decision, initiative and dexterity—above the average of his fellows, need not possess the power of command which is indispensable to the would-be officer, in which so many otherwise suitable candidates fall short of what is necessary. In the years of stringency, when the numbers both of officers and men of all the Services were kept strictly down to a bare minimum, there was perhaps reluctance on the part of the Royal Air Force to allow any of the few jobs as non-officer pilots to go to men of another Service. That condition, however, no longer obtains. The Royal Air Force has its work cut out to provide for its own expansion, and ought to be glad to be relieved of the drain on its resources which the Fleet Air Arm constitutes. The aircraft carriers are admittedly over-loaded with officers, both in the pilot and observer branches. A start has been made to reduce the proportion of officers to men in the latter, and the same thing in the former cannot presumably be long delayed.

NAVAL CO-OPERATION BY R.A.F. UNITS.

The following units of the Royal Air Force are designated in the Navy List as those "whose duties include Naval Co-operation or the training of personnel for the Fleet Air Arm":—

UNDER AIR OFFICER COMMANDING COASTAL COMMAND:—

NAVAL CO-OPERATION:—

No. 22 (Torpedo Bomber) Squadron	Donibristle.
No. 201 (Flying-Boat) Squadron	Calshot Station.
No. 204 (Flying-Boat) Squadron	Mount Batten, Plymouth.
No. 209 (Flying-Boat) Squadron	Felixstowe, Suffolk.
No. 210 (Flying-Boat) Squadron	Pembroke.

TRAINING FLIGHTS FOR FLEET AIR ARM:—

No. 1 Flying Training School	Leuchars.
Training Squadron	Gosport Station.

OTHER TRAINING UNITS:—

School of Naval Co-operation	Lee-on-Solent.
Training Squadron	Calshot Station.

UNDER AIR OFFICER COMMANDING R.A.F. MEDITERRANEAN:—

NAVAL CO-OPERATION:—

No. 202 (Flying-Boat) Squadron	Calafrana.
Station Flight	Hal Far.

UNDER AIR OFFICER COMMANDING IRAQ:—

NAVAL CO-OPERATION:—

No. 203 (Flying-Boat) Squadron	Basra.

UNDER OFFICER COMMANDING FAR EAST COMMAND:—

NAVAL CO-OPERATION:—

No. 230 (Flying-Boat) Squadron	Singapore.
No. 205 (Flying-Boat) Squadron	Singapore.
No. 36 (Torpedo Bomber) Squadron	Singapore.
No. 100 (Torpedo Bomber) Squadron	Singapore.

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THE FRENCH FLOTILLA LEADER LE MALIN.

Commissioned for Service, 1935.

(*By courtesy of the French Ministry of Marine.*)

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The number of machines in each squadron is not stated, so that it is not clear what force of aircraft this represents. It is understood, however, that twelve machines in a torpedo bomber squadron and six in a flying-boat squadron is a usual figure. On this basis, it would seem that there are some ninety shore-based aircraft available—sometimes—for naval co-operation throughout the world. A comparison of this figure with the number found necessary during the last War, 1914–1918, is illuminating. At the end of that War there were well over 1,000 aircraft wholly employed on naval duties, in co-operation with naval units. It must be admitted that, since the ninety of to-day are only part-time partners of the Navy, there would seem to be some ground for the apprehension, expressed by Sir Roger Keyes in Parliament, and by others, that all is not well in this particular department of Imperial Defence.

The Naval Co-operation units—the term is incorrect, but it is used for convenience to indicate those enumerated above—are exercised frequently in conjunction with ships; as frequently, that is to say, as is possible between units controlled by different Services. During the autumn exercise period of the Home Fleet an R.A.F. Squadron carried out a training attack on H.M. Ships. A comparison of this with the number of exercises in conjunction with ships carried out by the embarked squadrons of the Fleet Air Arm will no doubt give a measure of the amount of sea experience possessed by the two branches respectively. The state of emergency in the Mediterranean which arose out of the Italo-Ethiopian War, however, gave opportunities for co-operation at the various fleet bases—Gibraltar, Malta, Alexandria, Aden—quite out of the ordinary; full advantage was taken of these.

In addition to exercises in conjunction with naval forces, various R.A.F. units carried out extended voyages as part of their ordinary training. Details of these are as follows :—

Singapore—Hong Kong Flight.

After prolonged negotiations, arrangements were made for a visit to be paid in February and March, 1936, to Hong Kong and Japan by aircraft of No. 205 (Flying-Boat) Squadron. On no previous occasion had R.A.F. flying-boats proceeded further north than Hong Kong in the Far East. On February 10, three Singapore III aircraft, with the Air Officer Commanding, Far East, commenced the cruise from Singapore. They arrived at Manila on February 13, where one flying-boat had, however, to remain owing to engine trouble; it later proceeded to Amoy to rejoin the Squadron, where it arrived on February 19. In the meantime, the two other flying-boats, after delays at Hong Kong owing to bad weather, reached Amoy on February 23. The flying-boats left for Shanghai on February 24, but were forced to alight off the Chinese coast by bad weather. They were able to proceed on February 26, on which date they reached Shanghai. While there, news of internal political troubles which had occurred in Japan at the end of February was

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received, and it was decided to abandon the visit to that country; the flight did not, therefore, proceed any further.

The return journey from Shanghai was commenced on March 5, a visit being paid to Canton, after arrival at Hong Kong, by the Air Officer Commanding and the Air Attaché, Shanghai, with two flying-boats, at the request of the Chinese Central Government for the purpose of meeting Marshal Chen Chai Tong. The return journey to Singapore was completed on March 10. The itinerary of the flight undertaken was: outward journey—Singapore, Kuching, Kudat, Manila, Hong Kong, Amoy, Nam Kwan Bay and Shanghai; homeward journey—Shanghai, Hong Kong, Kamrhan Bay, Singapore.

Flying-Boat Cruise in South China Sea.

A Singapore III flying-boat of No. 205 (F.B.) Squadron left Singapore on September 21, 1936, conveying the Air Officer Commanding, R.A.F., Far East, and staff officers to Hong Kong for the annual inspection of the R.A.F. station, Kai Tak. The first day's flight was to Hon Kohe in French Indo-China, Hong Kong being reached on September 22. The return flight was commenced on September 25, and proceeding via Manila, Kudat (29th) and Kuching (30th), the flying-boat arrived at Singapore on October 2.

Mediterranean Flying-Boat Cruise.

A training cruise in the Mediterranean was carried out by four Scapa flying-boats of No. 202 (F.B.) Squadron, during October, 1936, the itinerary being as follows: October 9, Malta—Cattaro; October 10, Cattaro—Corfu; October 11, Corfu—Navarin; October 13, Navarin—Athens; October 15, Athens—Lemnos; October 16, Lemnos—Volo (via Thaso and Salonika); October 17, Volo—Suda Bay; and October 18, Suda Bay—Malta.

Inter-Command Flight—Singapore to India.

No. 36 (Torpedo Bomber) Squadron, consisting of twelve Vickers Vildebeest aircraft, carried out an inter-Command flight from Singapore to the Indian North-West Frontier Province and back, by easy stages in November and December, 1936. The itinerary of the outward flight was: November 3, Singapore—Penang—Alor Star; November 4, Alor Star—Victoria Point—Tavoy; November 5, Tavoy—Rangoon; November 6, Rangoon—Akyab—Calcutta; November 8, Calcutta—Gaya—Cawnpore; November 9, Cawnpore—Ambala; and November 10, Ambala—Lahore—Risalpur.

During the return flight, from Akyab to Tavoy the squadron divided so that the various emergency landing grounds in Burma might be visited and inspected. The itinerary followed to Akyab was: November 18, Risalpur—Lahore—Delhi; November 20, Delhi—Allahabad; November 21, Allahabad—Gaya—Calcutta; November 23, Calcutta—Chittagong—Akyab. The squadron re-

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assembled at Tavoy on November 28, having visited landing grounds at Kyaukptu, Mazin, Sandoway, Rangoon, Fenton Point, Gwa, Pagoda Point, Kyaikto, Moulmein and Ye. On November 29 the squadron flew to Bangkok, where it remained until December 2. This was the first visit of a unit of the Royal Air Force to Siam. Singapore was reached on December 5, visits having been paid to the landing grounds at Mergui, Alor Star, Victoria Point and Penang en route.

Move of No. 230 (F.B.) Squadron to Far East.

The five Singapore III flying-boats of No. 230 (F.B.) Squadron, which was being added to the establishment of the Far East Command, left Pembroke Dock for Singapore on October 14, 1936, and arrived at Singapore on November 6. Wing Commander W. H. Dunn was in command. The progress of the squadron was as follows: October 14, Pembroke Dock—Mount Batten; October 16, Mount Batten—Berre; October 17, Berre—Malta (three aircraft); October 18, Malta—Aboukir (two aircraft); October 18, Berre—Malta (two aircraft); October 19, Malta—Aboukir (three aircraft); October 22, Aboukir—Lake Habaniyah; October 23, Lake Habaniyah—Basra; October 26, Basra—Ras-el-Khaimah; October 27, Ras-al-Khaimah—Karachi; November 1, Karachi—Allahabad (four aircraft); November 1–2, Karachi—Allahabad (one aircraft); November 3, Allahabad—Calcutta; November 4, Calcutta—Mergui; and November 6, Mergui—Singapore.

Malta to West Africa Flying-Boat Cruise.

Two Supermarine Scapa flying-boats of No. 202 (F.B.) Squadron left Malta on December 12, 1936, on an inter-Command and colonial development flight to West Africa. Air Commodore P. C. Maltby, Air Officer Commanding, Royal Air Force, Mediterranean, accompanied the Squadron Commander, Wing Commander E. F. Turner, on the cruise. The flight proceeded via Algiers and Gibraltar to La Luz and thence down the West African coast via Port Etienne and Bathurst to Freetown, where the flying-boats arrived on December 21. Here one was delayed by engine trouble, while the other proceeded to Takoradi (Gold Coast) and Lagos, where it arrived on Christmas Day. Here it remained until January 2, returning then by way of Abidjan to rejoin the other boat at Freetown. Both aircraft left Freetown for the return journey to Malta on January 12, and proceeded via Bathurst, Dakar, La Luz, Port Etienne, Tangier and Algiers. They arrived on January 23, having flown a total mileage of approximately 9,000 miles.

New Reconnaissance Units.

A feature of the Royal Air Force expansion programme is the creation of seven new squadrons of general purpose aircraft for reconnaissance over the narrow seas. These units are not included

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in the list of those "whose duties include naval co-operation," and indeed have apparantly no connection with the Navy. They are being equipped with the Avro "Anson" aircraft, illustrated in the 1936 "Brassey," a type derived from the Avro 625A commercial aircraft, originally designated "coastal reconnaissance" machines; the description was later changed to "general reconnaissance." They are fitted with two Siddeley "Cheetah IX" engines, giving a full level speed at 6,000 feet of 190 miles an hour, and a cruising speed of 160.

The advent of this new type of twin-engined monoplane, able to fly satisfactorily on one engine, was stated in the Press to have brought about "a big change in the methods of reconnaissance in the narrow seas," and to have "made good a weak joint in our harness." Whereas formerly flying-boats were the only planes capable of reconnaissance over the sea, now land planes can, it is claimed, in many coastal districts, be based nearer to the scene of their possible operations than flying-boats, which require suitable harbours. The Air Correspondent of the *The Evening News* wrote on February 3, 1936:—

> The armament of the machine is well thought out. As well as reconnaissance, one of its main duties would be to bomb ships or submarines, and for this purpose a prone bombing position for the bomber is provided in the nose of the fuselage.

Another writer on air matters wrote:—

> The Air Council appears to have determined to strengthen Britain's coastal defence with a type of plane which is specially suitable for long hours of patrol over water. Such craft play a useful part in home defence because of their capacity to fly far out from the coast and to transmit by radio reports of the movements of invading ships and aeroplanes.

While some of the claims made for the new type in the Press may be exaggerated, there is no reason to suppose that the forecasts of the duties on which the new squadrons are to be employed are mistaken. But inasmuch as those duties are equally the function of naval units operating in the narrow seas, it must of course be due to an oversight that the new squadrons are omitted from the list of those "whose duties include naval co-operation." The only alternative explanation of the omission—that no co-operation is contemplated or is being organised—seems hardly credible.

The first of the new formations, No. 48 (G.R.) Squadron, moved from Bicester to Manston on December 16, 1935, and has remained a unit of the Training Command. It is apparently employed in the training of the large number of pilots who will be needed, as it has been stated that the new squadrons will be maintained at greater strength than the average home defence squadron, and will have a first-line establishment of eighteen aircraft each.

The other units form part of the Coastal Command. Those in being, or announced for formation, at the moment of writing are:—

No. 206 (G.R.) Squadron, formed at Manston on June 15, 1936, and transferred to Bircham Newton, King's Lynn, on August 4, 1936.

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No. 220 (G.R.) Squadron, formed at Bircham Newton on August 17, 1936.

No. 269 (G.R.) Squadron, formed at Bircham Newton on December 7, 1936, and to move to Abbotsinch, Paisley, by January 1, 1937.

No. 217 (G.R.) Squadron, to form at Boscombe Down, Wiltshire, on March 15, 1937.

RECENT EXPERIENCE ABROAD.

In conclusion, it would be incongruous to close this chapter without some reference to events abroad which cannot fail to influence the future development of Naval Air work in this and all other maritime countries. In the Spanish civil war experience is being gained in the problems that exercise our minds to-day. On the Government side there are modern Russian aeroplanes, of a number that is reputed to run into three figures, which are understood to be manned by highly trained Russian personnel. The insurgents under General Franco have at their disposal a part of the Spanish Navy, including the cruisers Canarias and Baleares, which they have utilised to hinder, as far as possible, the sea-borne supplies of their adversaries; and to judge from the public pronouncements of the Spanish Government, they have been fairly successful in that task. There should be here all the materials for a full-scale demonstration of the proposition, so often advanced by air enthusiasts, that air forces will drive naval forces off the sea.

Up to the time of writing, that demonstration has not been forthcoming. So far from being driven off the sea, General Franco's ships, which are based on the Balearic Islands barely an hour's flight from Republican Spain, do not seem to have been hindered in their operations in any way by the Spanish Government's Russian planes. Sea power, that is to say, in the Spanish war retains all its old potency, despite being pitted against air forces of the nation which has devoted to their development attention as great as any. Moreover, the operations of aircraft on both sides have exemplified the great difficulty under which all air units without sea experience labour when employed at sea—the difficulty of distinguishing friend from foe or either from neutral. These and other lessons which emerge from the Spanish experience will no doubt be given full weight by those responsible for Imperial Defence.

H. G. T.

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CHAPTER XI.

Foreign Fleet Air Arms.*

I. GENERAL POLICY.

The expansion of the two largest foreign Naval Air Services, those of the United States of America and Japan, has continued in accordance with the policies outlined in the 1936 "Brassey." The development in other countries, with the possible exception of Germany, has not been so marked, but, in nearly all cases, the policy upon which the developments are based is now becoming clear. It is possible, therefore, to summarise the main lines of policy of several of the larger Fleet Air Arms and to discuss the differences and implications contained in them.

CARRIER AIRCRAFT.

Only three foreign navies at present possess aircraft carriers, and each has followed rather similar lines so far as the aircraft equipment of these vessels is concerned.

UNITED STATES.

The aircraft carriers of the United States Navy hold the greatest variety of types. For instance, the aircraft complement of the Saratoga includes fighters, dive-bombers, scout-observation aircraft, scout-bombers, torpedo-bombers and a few "utility" aircraft. While there is clearly some advantage in providing aircraft specially designed for each type of duty, such a diversity of aircraft must complicate the operation of the squadrons, and a full day's flying under normal war conditions would undoubtedly impose a severe strain on the personnel who handle the aircraft. This latter factor must be an important consideration in such ships as the Saratoga and Lexington, which operate no less than 79 aircraft each.

JAPAN.

The largest Japanese aircraft carrier, the Kaga, operates some 60 aircraft, but the aircraft of all carriers in this navy are confined to two types, fighters and torpedo-bombers. The torpedo-bomber aircraft are presumably used for reconnaissance as well as for their offensive duty.

* Note.—Information given in "Brassey's Naval Annual" for 1936 is not repeated in this chapter.

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FRANCE.

The French aircraft carrier Béarn carries 36 aircraft (three squadrons). One squadron is equipped with fighters, one with torpedo-bombers and one with "surveillance," or short-range reconnaissance aircraft.

AIRCRAFT IN CAPITAL SHIPS AND CRUISERS.

The policy of carrying aircraft on catapults in fighting ships appears to have been universally adopted. As was stated in the 1936 "Brassey," however, it is doubtful whether any of the catapult aircraft in foreign navies could be landed and recovered without damage in ocean sea conditions, except on rare occasions. It remains true, therefore, that catapult aircraft must be looked upon mainly as "one flight" aircraft. Furthermore, catapults, cranes and hangars undoubtedly take up space and tonnage which could otherwise be utilised to increase the striking and defensive power of the ship. The value of aircraft which, in war, will seldom be able to fly a second time, hardly seems sufficient to counterbalance the consequent reduction in the ship's fighting efficiency. The difficulty would disappear with the design of an aircraft which could land in moderate seas, and with an improvement in picking-up devices similar to the Hein landing canvas.

It is noteworthy that the Italian Navy, one of those least affected by unsuitable sea conditions, is the only foreign navy known to have attempted one solution of the problem, the landing of an autogyro type of aircraft on board a cruiser. Nevertheless, whatever its merits and disadvantages, this policy of providing fighting ships with aircraft is followed in nearly all navies, large and small. All capital ships and cruisers, some destroyers and sloops, and even one or two submarines carry their complement of aircraft. The numbers carried in the various classes of ships differs in each navy, but all catapult aircraft are of similar type. They are all either floatplanes or small flying boats, and their function is normally observation or reconnaissance.

UNITED STATES.

If the number carried in each ship is taken to be the criterion, the United States Navy must be considered the most successful. Most of the battleships carry three observation aircraft, Pennsylvania and California having four each, while the larger cruisers all operate four scouting aircraft, and in some cases carry six. One submarine, S 1, is fitted to carry a small aircraft.

JAPAN.

Only a few of the Japanese cruisers carry as many as four, the number generally being three reconnaissance aircraft in the large cruisers and one in each of the small cruisers. The capital ships are, however, provided with three observation aircraft, as in the U.S. Navy.

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FRANCE.
GERMANY.

German armoured ships and cruisers each operate two seaplanes, and French capital ships and cruisers normally carry the same number. In both navies the function of these aircraft is observation and reconnaissance.

ITALY.

The Italian cruisers carry seaplanes or small flying boats, the numbers varying from one aircraft in the small cruisers to four in each of the latest cruisers. One submarine is designed to carry a small seaplane.

SOVIET RUSSIA.

Most of the battleships and cruisers of Soviet Russia carry one floatplane or small flying boat, but some of the cruisers operate two. Five destroyers are also fitted to carry seaplanes on catapults.

SWEDEN.

The Swedish cruiser Gotland is of interest as being the only cruiser which can be said to have been designed primarily to carry seaplanes. She normally operates eight seaplanes, but she is believed to be able to carry eleven.

OTHER NAVIES.

The navies of the Netherlands, Portugal, Spain and China also contain one or two ships which carry aircraft.

SHORE-BASED NAVAL AIRCRAFT.

In most foreign countries the division between shore-based naval aircraft and those used for air defence and army co-operation purposes is well defined. Even in those countries which have a single air force it is possible clearly to mark the division, since the functions of aircraft which operate over the sea have little in common with those that are employed over the land. Air fighting is the only duty common to both, but, to judge by the types of aircraft in coastal units, foreign countries do not consider that air fighting is likely to form anything but an insignificant part of the coastal operations. The main duties of coastal aircraft—search, patrol, anti-submarine work and attack on ships—are clearly naval duties. Aircraft, though inferior to other naval units in certain qualities of strategical mobility, endurance and striking power, do possess the advantage in speed and tactical mobility, and they are, therefore, particularly valuable for reconnaissance duties. This fact is fully realised abroad, and most countries have well-equipped shore-based squadrons with a preponderance of reconnaissance aircraft.

The actual lines of development in each navy have differed even in the main features of the aircraft provided for reconnaissance.

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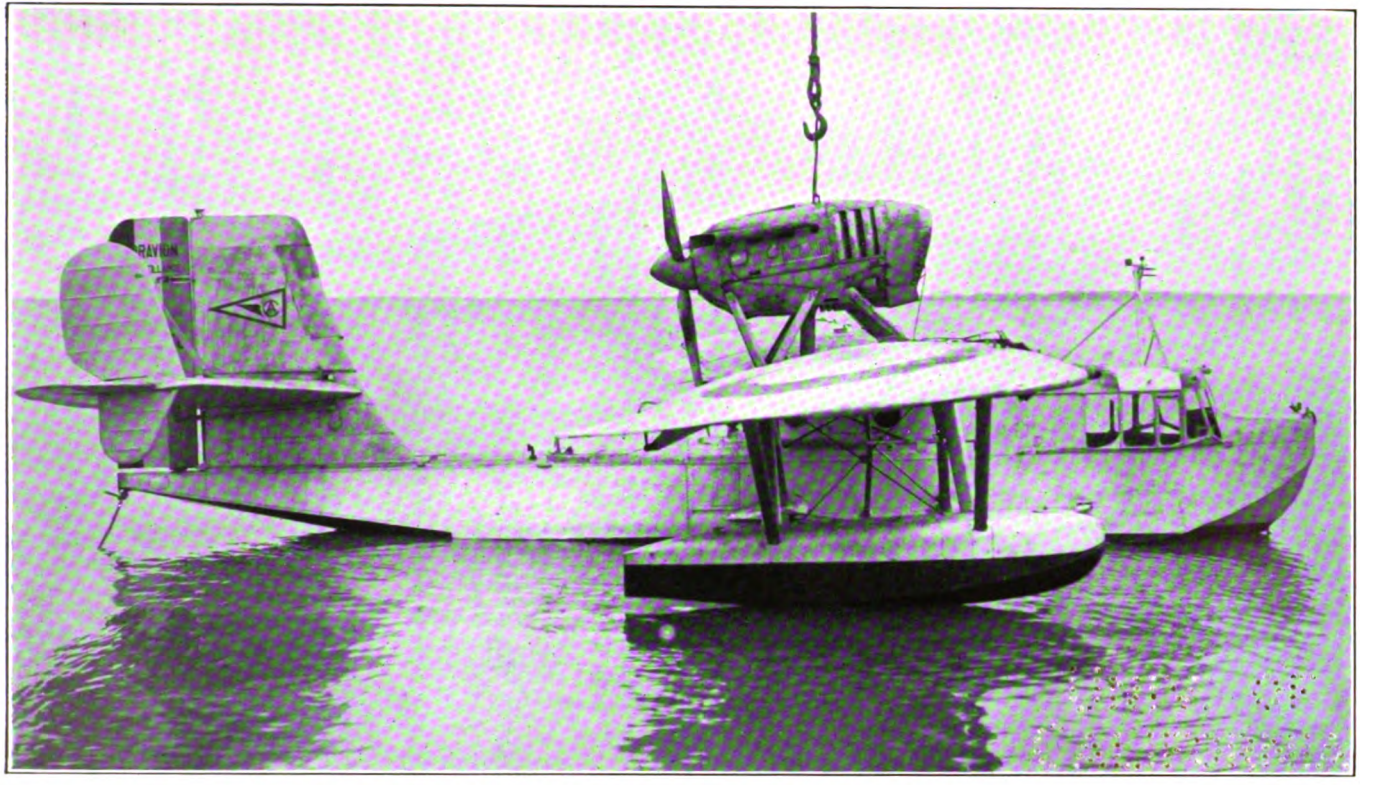

A FRENCH HYDRAVION DE SURVEILLANCE.

The Liore 130.

(By courtesy of the French Ministry of Marine.)

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Some navies favour the seaplane or land aircraft types, which operate only in coastal waters and close to their bases, while others prefer the long-range flying boat, which can fly to, and operate from, temporary bases many hundreds of miles from their main base. This difference in policy is probably governed by the strategical effect of geographical conditions.

UNITED STATES.

The United States of America, where the area of greatest strategical importance lies in the Pacific, find the long-range flying boat best suited to their needs. Indeed, in the development of this type they may be said to be supreme. The first-line strength of the U.S. Naval shore-based aircraft is of interest, in that the proportion allotted to each type gives some idea of the relative value placed on the various functions. Furthermore, the distribution of types is representative of most other foreign naval air services.

Flying Boats.	Reconnaissance.	Torpedo-Bombers.
114 Patrol. 44 " Utility."	31 Land aircraft.	24 T/B's. 18 Fighter Dive Bombers.

JAPAN.

Japan has island possessions which flank the Eastern China Sea and which skirt the northern fringes of the South China Sea, and her mandated islands reach out into the Pacific. For the Japanese, therefore, the long-range flying boat is not so essential, and they rely largely on the seaplane for coastal reconnaissance.

FRANCE.

France favours the flying boat, but she has two types, the " Exploration " (long range), and the " Surveillance " (short range). There are about eighty of these flying boats, the remainder of the coastal aircraft consisting of some sixty-six bombers and thirty fighters.

ITALY.

Italy's coastal commands are composed almost entirely of flying boats, most of which can be described as of the medium-range type.

SOVIET RUSSIA.

So far as is known, flying boats seem to form the main strength of the coastal squadrons in Soviet Russia.

GERMANY.

Germany is still in the development stage.

SEAPLANE CARRIERS.

The seaplane carrier is a type of vessel which has not been universally favoured in the large navies. Apart from the Swedish

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aircraft cruiser Gotland, only three navies have built or converted vessels designed for this purpose. The United States, for instance, possesses none, although certain ships are adapted as base ships for flying boats.

FRANCE.

The French seaplane carrier Commandant Teste can carry some twenty-six seaplanes. Some of these are torpedo-bomber seaplanes and the others are of the " surveillance " or short-range reconnaissance type.

ITALY.

The Miraglia carries twenty seaplanes, some being reconnaissance aircraft and some fighters. During the Abyssinian War she was used extensively for transporting aircraft from Italy to Eritrea.

JAPAN.

This type of ship is probably favoured most in the Japanese Navy, which possesses two seaplane carriers, the Notoro and Kamoi. Each carries eight or ten seaplanes. In addition, a further 10,000-ton seaplane carrier is under construction.

UNITED STATES.

The largest aircraft tender in the United States Navy is the Wright, which is also a lighter-than-air-craft tender. Besides this vessel, there are other small vessels acting as flying-boat base ships. Neither the Wright nor any of the smaller ships are seaplane carriers in the true sense.

II. ORGANISATION IN DETAIL.

UNITED STATES.

POLICY.

It is intended to increase the Fleet Air Force to Treaty Navy requirements. This involves the provision of 1,910 aircraft, and it is hoped to complete this programme by the year 1941. The figure quoted includes reserve aircraft, and it is assumed that the actual first-line strength will be about 1,270.

Rear-Admiral A. B. Cook, U.S.N., Chief of the Bureau of Aeronautics, stated that this force would be divided into sixty-one squadrons, of which twenty-two will be attached to the Patrol Wing.

It was announced that the strength of the Naval Air Force, including shore based squadrons, on July 1, 1936, was 977 serviceable and 244 obsolescent aircraft. The figure of 977 serviceable aircraft presumably includes reserves, since the total number of aircraft in service squadrons and ships on July 1, 1936, was shown by the Navy Directory to be 659, which figure includes Fleet Marine Force aircraft.

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PERSONNEL.

Rear-Admiral A. B. Cook, U.S.N., became Chief of the Bureau of Aeronautics in succession to Rear-Admiral E. J. King, U.S.N. Rear-Admiral Cook was appointed to this position from that of Assistant Chief of the same Bureau.

The future shortage of flying personnel, mentioned in the 1936 "Brassey," has continued to receive serious consideration, and a new scheme for the direct entry of "Aviation Cadets" was started in 1936. These cadets are entered from civil life and, after a period of training, do three years' service at sea. At the end of this service they are to be given a commission and placed in the Reserve. Thus, besides helping to meet immediate requirements, this scheme will provide a useful reserve for war.

AIRCRAFT CARRIERS.

The new 14,500-ton aircraft carrier, authorised under the Vinson Act to replace the Langley, was laid down in April, 1936. She is to be called the "Wasp."

The two carriers Yorktown and Enterprise were both launched successfully during 1936, the first on April 4 and the latter on October 3. Both are of 20,000 tons displacement and are due for completion by the middle of 1937.

SERVICE AIRCRAFT.

The Grumman F3F 1, a single-seater pursuit plane with a top speed of over 200 knots, is now in service as a ship-plane.

The Consolidated Aircraft Corporation of San Diego have received an order for the supply of a further fifty long-range patrol-bomber flying boats. Sixty of these boats were ordered in 1935, and some are now in service, having replaced obsolescent aircraft at the Fleet Air Base at Pearl Harbour, T.H. These aircraft are monoplanes, are fitted with two Pratt and Whitney engines, and have a range of well over 3,000 miles. The type is to be known as PBY-1.

A new type of scout-observation aircraft, known as the SOC-1, is now being supplied to cruisers. Built by Curtiss and fitted with a Pratt and Whitney engine, it is said to have a cruising speed of some 90 knots and an endurance of 10 hours.

The Navy have recently ordered eighty-three Curtiss two-seater scout-bombers (Type SBC-3). Details of the performance of these aircraft are not known.

Some older types of aircraft still in service are :—

SHIPPLANES.

Fighters.—Curtiss BF2C1, Boeing F4B4 and Grumman F2F1.
Observation.—Curtiss O2C-1.
Torpedo-Bombers.—Martin BM2 and Great Lakes TG-2.
Scouts.—Vought SU2 and Vought SU3.

FLOATPLANES.

Observation.—Vought OU3.
Patrol Flying Boats.—Martin PM-1, PM-2 and Consolidated P2Y-1.

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LIGHTER-THAN-AIR CRAFT.

The successful trans-Atlantic flights of the German airship Hindenburg have stimulated the pro-airship faction in the United States, and the Navy is being urged to recommence construction of these ships. Alternatively, it has been suggested in some quarters that the Government should buy an airship from the Zeppelin Company. A definite decision on airship policy is expected during the next Session of the United States Congress.

SPECIAL FLIGHTS AND OPERATIONS.

Commander McGinnis, piloting a new PBY–1 flying boat, flew from Norfolk to Coco Solo in the Panama Canal Zone, and thence to Acapulo, Mexico and San Francisco. Both flights were made without intermediate stops.

In the latter part of 1936, naval air squadrons at Honolulu carried out extensive operations round the islands south and west of Hawaii, four squadrons and four aircraft tenders taking part. French Frigate Shoals, 575 miles west of Honolulu, was the concentration point. The Bureau of Aeronautics stated that the object of the exercises was to give the patrol planes experience of extended operations away from their home bases.

JAPAN.

POLICY.

The Replenishment Plans are likely to complete in 1938 according to schedule, and there will then be a first-line strength of 392 ship-borne and 472 shore-based aircraft, these figures probably being exclusive of reserves.

If all the present ship-borne units are fully equipped, the first-line strength of the Imperial Japanese Naval Air Service afloat is now 266 aircraft. The number of shore-based naval aircraft is not known accurately, but, assuming that expansion ashore has reached the same stage as it has afloat, the total must be in the neighbourhood of 315.

PERSONNEL.

Schemes to provide the necessary personnel for the expanding Naval Air Service were described, in so far as they were known, in the 1935 and 1936 "Brassey." It is understood that the position is now satisfactory.

AIRCRAFT CARRIERS.

The 10,000-ton carrier Soryu was launched in December, 1935, and the Japanese Press states that her sister-ship, the Hiryu, was laid down in July, 1936.

The Ryujo was still refitting early in 1936.

It is reported that the Kaga has completed the long refit started in 1933, in the course of which her aircraft accommodation has been increased.

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SERVICE AIRCRAFT.

So far as is known, the shipplanes in service are the same as those given in the 1936 "Brassey."

It is believed that the Type 15 floatplane has been replaced by the Type 90–2 in battleships and cruisers. Type 90–2 is a three-seater reconnaissance aircraft.

A Japanese newspaper published the following details of the performances of certain naval aircraft which are now in service :—

SHIPPLANES.

Type 90 S.S. Fighters.—Top Speed 160 knots. Endurance 3 hours.
Type 89 Torpedo-Bombers.—Top Speed 115 knots. Endurance 3 hours.
Type 92 Torpedo-Bomber.—Top Speed 120 knots. Endurance 4½ hours.

FLOATPLANES.

Type 90–2 Reconnaissance.—Top Speed 145 knots. Endurance 6½ hours.
Type 90–2 Flying Boat.—Top Speed 120 knots. Endurance 14½ hours.

Apart from the details given in the 1936 "Brassey," the performance of the new Type 91 flying boat is not known.

BASES.

Of the seven new naval aerodromes reported in the 1936 "Brassey" as being under construction, three have since been opened. Those completed are Maizura, Kanoya and Kisarazu.

FRANCE.

ORGANISATION.

The previous organisation of the French Naval Air Service was given fully in the 1936 "Brassey," but since the publication of that volume a further decreee has been issued. The Naval Air Service as a whole is now known as the "Aéronautique Maritime," and is divided as follows :—

(1) "Aéronautique Navale." This is entirely naval. Both the operations and the administration of this force are under the direct control of the Minister of Marine, and the personnel are all naval. It is sub-divided into the "Aviation Embarquée" (ship-borne aircraft), and the "Aviation Navale non-embarquée" (shore-based squadrons).

(2) "Aéronautique de Coopération Maritime." This is a section of the Armée de l'Air, which has been specially trained for co-operation with the sea forces. It is under the direction of the Air Minister and is manned by personnel of the Armée de l'Air.

POLICY.

Monsieur Pierre Cot, the Air Minister, has announced that the Government intends to nationalise the aircraft industry, but details of the scheme are lacking.

The first-line strength of the Aéronautique Maritime is about 230 aircraft, of which some 62 aircraft are embarked in ships.

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The number of aircraft in the Aviation Embarquée is considerably below requirements.

SERVICE AIRCRAFT.

A new type torpedo-bomber seaplane has made its appearance. It is fitted with two Gnome engines and is said to have attained a speed of some 150 knots.

(See also Chapter XII.)

GERMANY.

ORGANISATION.

This was fully explained in the 1936 "Brassey," but it is as well to realise that the officers, although now serving in the German Air Force, served in the Navy until they were transferred in 1933. This is true also of the Commander of the VIth Area, General Sander.

It is understood that there is no interchange of officer personnel between the VIth Area and the rest of the Air Force.

AIRCRAFT CARRIER.

The French Press report that the first German aircraft carrier has been laid down, and that she will be of 18,500 tons. According to the same source, she will carry twenty-five aircraft.

SERVICE AIRCRAFT.

The Heinkel 60, a two-seater floatplane, is the aircraft which is supplied to ships. It is used mainly for reconnaissance, and is said to have an endurance of five hours with a cruising speed of about 100 knots.

Other aircraft in the Naval Air Arm are the Heinkel 51, single-seater fighter, which has a top speed of 190 knots and an endurance of about two hours, and two Junkers civil types, the W34 and the Ju52. The latter is for reconnaissance and bombing.

BASES.

The main base of the VIth Area is at Holtenau, Kiel. It is a combined aerodrome and seaplane base.

ITALY.

POLICY.

The rearming of the sea squadrons, referred to in the 1935 and 1936 "Brassey," is believed to be well advanced. On the other hand, the numbers show little or no increase and the strength of the Sea Commands of the Regia Aeronautica remains approximately as follows :—

14 Sea Reconnaissance Squadrons—126 aircraft.
10 Sea Bomber Squadrons—90 aircraft.

In addition, there are approximately twenty-seven aircraft, mainly fighters, which can be embarked in ships.

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SERVICE AIRCRAFT.

Most of the aircraft belonging to the Sea Commands of the Air Force are of the flying-boat type. Many of the squadrons have now been rearmed with the Cant Z501 flying boat, which has a top speed of 140 knots and an endurance of 11 hours.

The Cant 25 single-seater flying-boat fighters are being replaced in cruisers by a Romeo single-float biplane. This aircraft is a two-seater reconnaissance aircraft of high performance.

PORTUGAL.

As stated in the 1936 "Brassey," the equipment of the Naval Air Service, which is part of the navy and comes under the control of the Minister of Marine, is being modernised. In pursuance of this policy, six "Shark" aircraft were purchased from the Blackburn Aeroplane and Motor Company of England. These aircraft were delivered early in 1936.

The Portuguese Naval Air Service now possesses six "Shark" seaplanes, some eleven older seaplanes of German and French makes, and a few other aircraft used for training.

SOVIET RUSSIA.

There is little to add to the information given in the 1936 "Brassey." There are three Naval Air Commands, the Baltic, Black Sea and the Far East, but their strengths are not known. The first two contain both fighter and bomber squadrons as well as flying-boat reconnaissance squadrons, but the Far East Command is probably equipped only with reconnaissance aircraft.

The statement that the cruiser Krasni Moryak has been converted into a seaplane carrier is open to some doubt.

HOLLAND.

The Prime Minister made his promised statement on Defence Policy in the Netherlands Parliament in August, 1936. He stated that it was proposed to buy sixty large sea-scouting aircraft. As a first instalment six Dornier flying boats had already been ordered, while twelve more similar aircraft were to be ordered during the year. A further eighteen sea scouts are to be ordered in 1937.

SPAIN.

Spain became engaged in civil war in the summer of 1936, and there is little news available as to the present state of affairs.

The old Government battleship Jaime I was hit by a bomb during an air raid on Malaga. The weight of the bomb has been variously estimated as from 300 to 600 pounds. A photograph, published in *The Times*, showed large holes on both sides under the forecastle, but it appears that the bomb caused little damage of

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serious consequence. After docking at Cartagena, the ship was apparently on service again in under three weeks.

Other raids have been carried out on ships both in harbour and at sea, but, so far as can be ascertained with any certainty, no further success has been achieved on surface ships. It is understood, however, that a Government submarine was damaged by air attack, but was able to make port.

VIGILANCE.

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CHAPTER XII.

French Naval Air Service.

I. ORGANISATION.

A new constitution for the French Naval Air Service was established by a decree of August 22, 1936. Prior to that, under the Decreee of November 27, 1932, the Naval Air Service comprised :—

The Embarked Force (L'Aviation embarquée), which belonged entirely to the Navy ; and

The Coastal Force (L'Aviation côtière), which was manned chiefly by naval personnel and a smaller part only by Air Force personnel.

That part of the Coastal Force which was manned by naval personnel was under the authority of the Air Minister ; but he placed it *permanently* at the disposition of the Minister of Marine. That part of the Coastal Force which was manned by Air Force personnel was, in principle, allocated to the duty of naval co-operation, so long as the Government did not prescribe for it any other employment.

To-day, a simpler and more convenient organisation is in force. Under the Decree of 1936, the French Naval Air Service comprises two elements :—

(1) The Naval Air Arm (*l'Aéronautique Navale*) (embarked and non-embarked), manned by naval personnel, established by the Minister of Marine and under his control, a charge on the naval votes, and in control of its own bases and depots.

(2) The Naval Co-operation Force (*l'Aéronautique de Co-opération Maritime*), consisting of units properly belonging to the Air Force (*l'Armée de l'Air*), manned by Air Force personnel, but always at the disposal of the Navy unless the Government should decide otherwise.

This last is based in time of peace on stations chosen by the Air Minister after consultation with the Minister of Marine. Its training, so far as concerns its preparation for operations in combination with the Navy, is organised by Air Headquarters, in consultation with the Naval Command.

The Naval Air Arm (*l'Aéronautique Navale*) is thus manned, raised and trained for intimate collaboration with the Navy, and more particularly with ships. It forms an integral part of the Naval Forces. It acts in conjunction with naval forces in order to further the execution of the latter's tasks, and to allow them to seize the advantage in the tactical situations which are presented to them. In other words, it is intended to take part in naval battles on equal terms with the fleets, concurrently and in co-operation with them.

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On the other hand, the Naval Co-operation Force (*l'Aéronautique de Co-opération Maritime*), provided from the Air Force (*l'Armée de l'Air*), is more particuarly intended to act for the benefit of the Naval Forces, but independently of them. To it is allotted, for instance, the surveillance or attack of an enemy's coastal bases, the patrolling of certain zones, and the attack of enemy men-of-war which no friendly ship is able to engage. Generally speaking, it is not intended to take part in naval battles, but to operate only where enemy naval forces are not present.

MATERIAL.

The Minister of Marine lays down the "programme" for the provision of that material which the Naval Air Arm (*l'Aéronautique Navale*) needs in order to carry the tasks allotted to it. The Air Minister is responsible, technically and industrially, for carrying out this programme, and for trials in accordance with it. The Minister of Marine is responsible for the study of the tactical employment of his material, but he keeps the Air Minister informed of the results of that study.

TRAINING.

The technical and practical flying training of personnel of the Naval Air Arm is the responsibility of the Air Ministry, though its personnel is provided by and from the Navy. Its sea training and practice and tactical training is the responsibility of the Navy.

To sum up, the Air Ministry has the responsibility for everything concerning flying, and matters arising out of air manœuvring (stowage and trim of machines, for instance); the Minister of Marine is responsible for everything specifically naval.

BASES.

(1) The Naval Air Arm.

Cherbourg.	
Chantereyne.	3 Flights (*escadrilles*) (seaplanes).
Brest.	
Lanveoc-Poulmic.	2 Flights (seaplanes).
Rochefort.	Balloon Station (*dirigeables*).
Toulon.	
Berre.	5 Flights (seaplanes).
St. Mandrier.	Base for Embarked Aircraft.
Hyères Palyvestre.	Base for Embarked Aircraft (land machines).
	1 Flight (seaplanes).
St. Raphaël.	1 Flight (seaplanes).
	C.E.P.A.
Karouba.	
Bizerta.	2 Flights (seaplanes).

(2) The Naval Co-operation Force.

Marignane.		Sidi-Ahmed.	Tunis.
		Menzel Temin.	Tunis.
Lessay.			
Guipava.			
Campo del Oro.	Corsica.	Alger.	Algeria.
Borgo.	Corsica.	Baraki.	Algeria.
		La Senia.	Algeria.

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II. COMPOSITION AND EMPLOYMENT OF THE NAVAL AIR ARM.

As in all navies, without important exception, the employment of the Naval Air Arm is divided broadly between the tasks of cruiser work, search, watching, bombing, torpedo attack and air fighting. But in these tasks the two parts of the Naval Air Arm require machines of different descriptions, depending on the role they have to fulfil.

(1) SHORE-BASED NAVAL AIR ARM

(*i.e.* that part which is not embarked).

Cruiser Work.

The location of fleets at a distance, the protection of trade on the chief imperial trade routes, the search for an enemy in a vast theatre of operations—these are the tasks of cruisers. They call for machines which have large radius of action and well-developed defensive qualities. Such are the "cruiser" flying boats, of which the commercial flying boat "Lieutenant de Vaisseau Paris" possesses certain characteristics.

Search.

The analogous operations in smaller theatres, such as certain closed seas or that part of the ocean which is near the continental coast, are allotted to flying boats of the "*exploration*" class, of which the characteristics are similar to those of the cruiser class, but less developed. "*Exploration*" flying boats are generally machines of about 10 tons.

Machines in service :—

Cams 55.	Bréguet-Bizerta.
Short.	Loire.

The aerodynamic and sea-keeping qualities required by "cruiser" and "*exploration*" aircraft, and their equipment for navigation, make them essentially "small flying ships."

Watching.

The search for submarines, for mines, and the coastal patrol is allotted to "watching" units. The aircraft which compose these units need only have a few hours' range, but they must be handy, in order to be more efficient in attack, and must carry bombs. They are two-seaters and three-seaters.

Machines in service :—

Cams 37A and 55A.

Bombing.

Shore-based bombing flights must be capable of carrying a considerable weight of bombs the greatest distance possible and as

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rapidly as possible, in order to reach the scene of battle and take part in it in time to be of use. They are composed of machines of fairly large tonnage (about 10 tons).

Machines in service :—

Lioré-Ollivier 257 bis and 258.

Torpedo Attack.

There are also shore-based flights specially allocated to torpedo attack. The qualities necessary in these are high speed and manœuvrability to enable them to achieve surprise in attack and to disengage themselves rapidly afterwards; the size of these machines is necessarily moderate (2 to 3 tons). The machines of torpedo squadrons are actually floatplanes.

Machines in service :—

Latécoère 29.

(2) EMBARKED NAVAL AIR ARM.

The same duties are required from the embarked Air Arm, but the machines which compose it are necessarily of smaller size and weight, and they cannot work very far away from the ships which carry them. Their tasks therefore reduce to the location of enemy naval forces, the protection of their own fleet, torpedo attack and bombing. The last-named may be either level bombing or dive bombing.

One must mention here one task which the shore-based Naval Air Arm does not carry out—because the Air Force (*Armée de l'Air*) undertakes it exclusively from the land—but which the embarked Naval Air Arm has to do; that is, air fighting. There are thus three classes in the embarked Naval Air Arm—reconnaissance machines, torpedo bombing machines, and fighters.

The embarked Air Arm comprises machines carried in aircraft carriers (wheeled aircraft) and those carried by fighting ships, battleships and cruisers (seaplanes, which are generally catapulted). While the carriers' machines are of all three classes, those of the fighting ships are only of two—reconnaissance and fighters. The embarked Air Arm may be described essentially as a weapon destined to be used by the Admiral in battle, at the precise point which he chooses, and at the moment he adjudges most opportune.

Machines in service :—

	Landplanes.	Seaplanes.
Fighters.	Dewoitine.	——
Reconnaissance.	Levasseur PL 10.	Gourdon-Lesseure.
Bombers.	Levasseur PL 7.	Levasseur PL 15.

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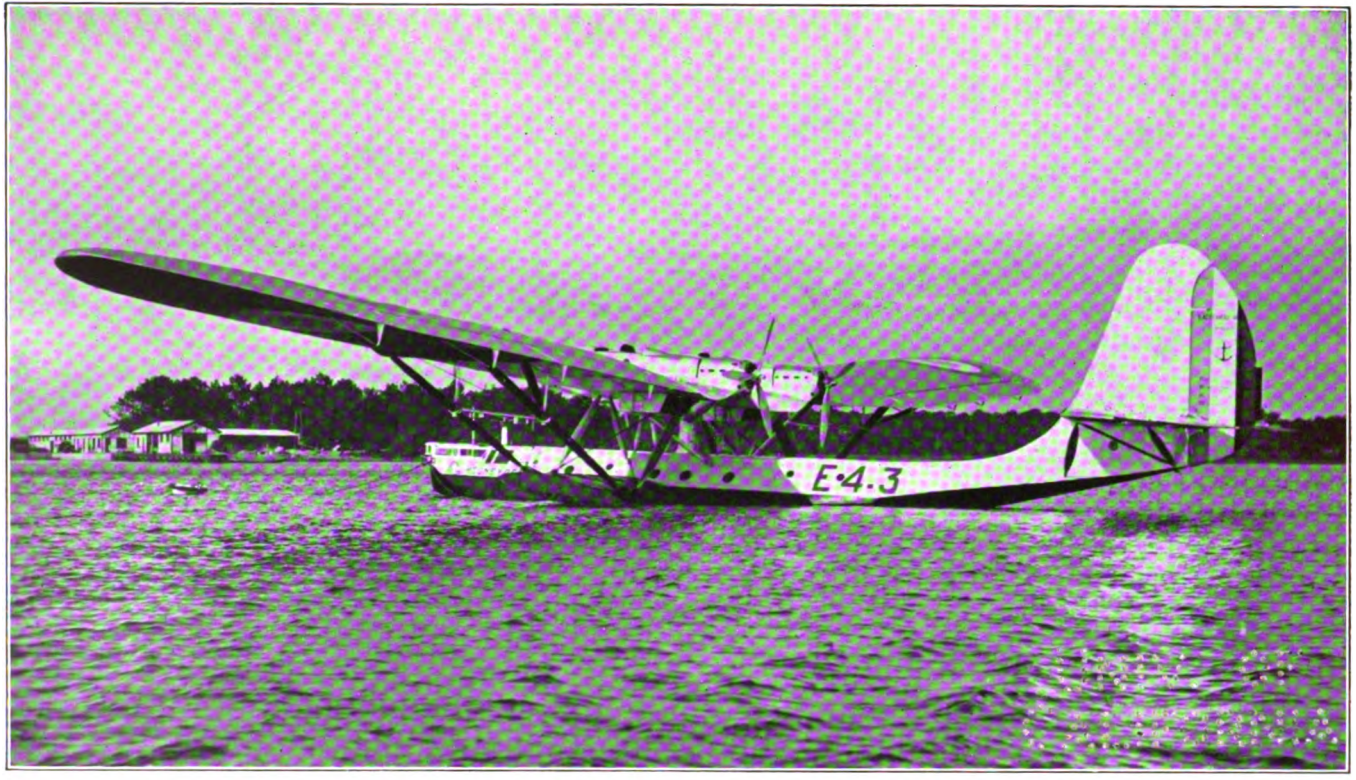

A FRENCH HYDRAVION DE CROISIERE.

The Latécoère 302.

(By courtesy of the French Ministry of Marine.)

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III. COMPOSITION AND FUNCTIONS OF THE "NAVAL CO-OPERATION FORCE" OF THE AIR FORCE (*L'ARMÉE DE L'AIR*).

While the composition of the naval co-operation squadrons is not definitely laid down, they contain in fact only bombers and fighters. The number of each type allotted to naval co-operation by the Air Minister is not in principle invariable. At present this force is formed of one bombing squadron (containing four flights) and one fighter squadron. The Naval Co-operation Force uses either land machines or seaplanes. Its land machines are, generally speaking, of the same type as those of the same class in the Air Force; its seaplanes are of the same type as those of the same class in service in the Navy.

The tasks of the naval co-operation squadrons * are particularly, as has been already indicated :—

Bombing of enemy coastal bases.
In exceptional cases, the bombing at sea of ships not engaged.
Reconnaissance of the enemy coast.
Certain permanent patrols, in narrow waters, for instance.
For fighting aeroplanes, defence of the coast against air attack.

NAVAL AIR ARMS IN THE GREAT WAR.

The rudimentary material which during the War of 1914–18 was at the disposal of the Naval Air Services did not permit them to carry out all the tasks which have just been explained. It is possible, however, to find, in the operations which actually took place, examples where the Naval Co-operation squadrons of the Air Force had their part to play, while in other cases the Naval Air Arm only could take part. Lieutenant-Commander Barjot, in the *Revue Maritime* and in the *Air Force* magazine, has published studies of these sea-air operations of the Great War.

Generally speaking, the operations in Flanders and the North Sea were those of naval co-operation—the bombardment of Dunkirk, of Dover, and the outskirts of London by German seaplanes based on Zeebrugge, on December 21 and 25, 1914; the bombing of the German aerodrome at Ghistelles and the entrance to Zeebrugge by the Anglo-French naval air forces in February, 1915; the bombing of submarine building slips at Hoboken by the British on March 24, 1915; the bombardment of the German Zeppelin sheds at Brussels in June, 1915; the attack on the German air bases at Mariakerke and Coudekerque in April, 1916; and air fighting both by landplanes and seaplanes by the French, British and German air forces, etc.

All these operations are those of naval co-operation. They were, from the naval point of view, useful, sometimes indispensable. But they were specifically air operations made directly or in counter-

* It must be remembered that this force is not intended to take part in naval actions.

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attack for the benefit of the Navy, but not in conjunction with naval forces.

On the other hand, we have a striking example of action in conjunction with ships reserved to a Naval Air Arm in the fight on May 15, 1917, in the Adriatic, in the course of which Admiral Horthy, coming from Cattaro with three fast cruisers and two flotilla leaders, succeeded in destroying twelve drifters in the Otranto Channel and then returning to Cattaro. We cannot do better than quote the text of Lieutenant-Commander Barjot (*Revue Maritime*, October, 1936), describing the return of Horthy towards his base :—

It may be said that if the Austrian naval forces escaped disaster, it was thanks to their air forces, which turned the scale. Horthy had arranged beforehand that his return route from the Otranto Straits to Cattaro should be reconnoitred at dawn by three seaplanes—two from Durazzo, K. 177 and K. 179, and one from Catarro, L. 88. The Austrian cruisers were thus well informed very early, from 7.20 a.m. onwards, by the L. 88. The two Durazzo seaplanes not only dispelled the obscurity of the situation for the Austrians, but also took a part in the first gun engagement.

A little before 8 a.m., Horthy's advanced force (Csepel and Balaton), which was an hour in advance of the cruisers, came into contact with five flotilla leaders of the Aquila class. The fire of the two Austrian destroyers was assisted by the aerial observation of a new-comer, the seaplane K. 153, which was fitted with wireless telegraphy. Hit early in the engagement, the Aquila had to stop; the Csepel and Balaton took advantage of this to break off action and retire towards Durazzo.

* * * * *

When a little later, at about 9 a.m., the three "Novarra" class cruisers, escorted by the Durazzo seaplanes K. 177 and K. 179, ran across the more powerful English cruisers Dartmouth and Bristol, Horthy was obliged to accept action. The two Austrian seaplanes attacked the leading cruiser Dartmouth with bombs and machine guns; two bombs fell close to her. Two other seaplanes, K. 205 and K. 206, attacked the rear cruiser Bristol.

* * * * *

About 11 a.m., the situation again became grave for Horthy. The Saida, damaged by the English fire, dropped astern of the Novarra and Helgoland. But this time, too, the Austrian cruisers were to be saved by their aircraft. Two seaplanes, K. 152 and K. 195, vigorously attacked the British cruisers, and allowed the Saida to regain her station.

* * * * *

In a study of naval air work by Lieutenant Marchand, published in the *Revue Maritime* in November, 1936,* are to be found interesting estimates of what might have been achieved by aircraft, if they had been available, in the search for Hipper's force by the forces of Warrender and Beatty after the bombardment of Hartlepool and Scarborough on December 16, 1914.

* * * * *

What nobody could have foreseen 22 years ago is to-day a reality. The progress of science, the evolution of material, the study of air questions, the lessons learnt from manœuvres have rapidly increased the importance of the Naval Air Arm, which to-day justly constitutes an integral part of the Fleet.

P. VINCENT-BRECHIGNAC,
Capitaine de Vaisseau.

* A study to which the author is indebted in the composition of these notes.

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CHAPTER XIII.

Trans-Atlantic Air Services.

The year 1937 promises to show a number of interesting developments in Trans-Atlantic Air Services both for passenger and mail transport. Apart from the international prestige to be gained from the operation of a successful and regular service, there appears to be a commercial demand for a rapid means of transport between Europe and the United States of America or Canada. A number of countries have recognised this fact and are preparing for services to be operated shortly, and the situation appears to be developing into a race for supremacy on much the same lines as that already existing in the Atlantic steamship services. To a certain extent the Zeppelin Hindenberg may be said to have won this race, as Germany has during the past summer been operating a regular passenger and mail service between Frankfort and Lakehurst, U.S.A., by airship. The time taken, however, although considerably quicker than by the steamship services, is slow compared with the schedules that may be expected from modern aeroplanes or flying boats.

Since Alcock and Brown first crossed the North Atlantic from Newfoundland to Ireland in 1919, and Hinkler flew the South Atlantic solo from west to east in 1931, a considerable number of successful flights have been made both by aeroplanes and airships. All flights by aeroplanes have, however, been uneconomic, as little or no paying load has been carried, the whole of the available load being used for the fuel and crew. The flights by airship beginning with the R. 34 in 1919, and now followed by the Zeppelin Hindenburg during the past summer, have been more successful, as a reasonable paying load has been carried, although the speeds have been comparatively low. To compete with the fast and luxurious steamship services it is maintained that the saving in time must be considerable if regular passenger traffic is to be obtained at the high rates which must be charged, even if assistance by Government subsidy is given.

ROUTES.

The direct distance between Ireland and the United States is of the order of 2,500 statute miles, a distance which will necessitate a large fuel load, particularly as head winds of the order of 40 m.p.h. must be allowed for. Three alternative routes may be used to reduce the amount of fuel carried ; in these the total distances are greater, but one or more stops reduce the distance which must be flown without refuelling. The routes are :—

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(1) By Ireland and Newfoundland, the longest stage being about 2,060 miles.

(2) By the Azores and Bermuda, the longest stage again being about 2,060 miles.

(3) By Greenland. The longest stage being about 600 miles.

Of these routes the shortest is via Newfoundland, the total flying distance between London and New York being of the order of 3,600 miles. This route can at present probably be used only during the summer months, as it suffers from fog during the rest of the year.

The second route is the longest, but is clear of fog at all seasons. The total distance between London and New York by this route is about 4,800 miles, the probable stops being Lisbon, the Azores and Bermuda. The main difficulty of this route is the smallness of the harbour in the Azores and the strong westerly wind which is experienced during most of the year. The former difficulty may be overcome by catapulting, as will be explained later, or, of course, the existing harbour may be enlarged, although the cost of this would be considerable. The difficulty of the strong head wind will increase the amount of fuel which must be carried, and accurate weather forecasts will be needed to avoid carrying more weight than is necessary. One advantage of this route is the summer passenger traffic between Bermuda and New York. The distance from Bermuda to New York is considerably less than from Bermuda to the Azores, so that aircraft crossing the Atlantic will need less fuel on this "hop," and so will be more lightly loaded if they are carrying only the Trans-Altantic load. It will therefore be possible to load up the aircraft to the normal Trans-Atlantic weight by carrying extra passengers between Bermuda and New York.

The third route, by Greenland, involves the shortest "hops," but suffers, during most of the year, from fog. The total flying distance in this case between London and New York is about 4,150 miles, and it is unlikely that this route will be used until the technique of flying, and more particularly of landing, in fog is better established. In addition, although the total distance is less than by the Azores, there is little likelihood of obtaining much mail or passenger traffic for the intermediate stages.

The direct route, involving as it does a flight of 2,500 statute miles against head winds of a mean speed of 40 m.p.h., is a difficult, though not impossible, undertaking with present aeroplanes. With airships longer non-stop flights are possible, and reasonable mail and passenger loads may be carried across the Atlantic, as has been shown by the service that has been operated by the *Deutsche Zeppelin Reederei* during the past summer. A total of fourteen crossings has been made and 10 tons of mail and 132 passengers have been carried. The average speed was approximately 80 m.p.h., and the average times between Frankfort and Lakehurst, U.S.A., were 63 hours westbound and about 51 hours eastbound, the difference between these two times showing the very great effect head winds have on slow-speed aircraft, which are naturally more affected than those with a higher cruising speed. The North Atlantic service by the

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Hindenberg follows the lines of the very successful service operated by the Graf Zeppelin in the Berlin–South America service, where about 100 crossings have been made without accident in the past two years.

THE PROBLEM OF TAKE-OFF.

A number of direct flights have been made by aeroplanes across the North Atlantic, but so far no reasonable commercial load has been carried, due to the limitations placed on the flying weight of the aeroplanes by the take-off. The more heavily an aeroplane is loaded the longer is the take-off distance, and there is a limiting weight at which an aeroplane cannot take off, although with modern aeroplanes flight would be possible at appreciably greater weights with a relatively small drop in cruising speed.

The most obvious method of overcoming this limitation is to increase the engine power that can be used for take-off; this involves a slight increase in weight and requires the use of variable pitch airscrews. As these are now fitted to most modern aircraft the only increase in weight will be that of the engine. One undesirable result is that the engine will be highly stressed immediately before a long flight on which reliability is essential. It is nevertheless a method which is quite practicable, and already engines are available which give considerably increased power for take-off when variable pitch airscrews are used. This method, however, does not go far enough, and other devices have been developed to overcome the difficulty.

The one which is being used on the German South American route, and experimentally on the North Atlantic Azores–Bermuda route, is that of catapulting, whereby the aeroplane is accelerated by means of compressed air or by some similar method, so that it leaves the catapult at approximately the normal take-off speed. This method is limited only by the maximum weight that can be dealt with by the catapult and by the take-off speed that is required. The take-off speed increases as an aircraft is loaded up, so that catapult speeds approaching 100 m.p.h. will be needed for some of the designs which are now contemplated. So far catapulting has only been regularly used commercially for mail traffic, but if the acceleration, or more correctly, the rate of change of acceleration, is kept low there appears to be no reason, except prejudice, why this method should not be used for regular passenger services. In fact, it appears at the moment to be the most promising method for the routes where long distances have to be flown non-stop. The cost of the catapult will be considerable if it has to deal with the large flying boats which are now contemplated, but the depreciation should be very low and the upkeep costs small. The use of this scheme reduces one of the difficulties of the Azores–Bermuda route, where the restricted harbour at Horta Bay will prevent heavily loaded flying boats from taking off. Landing in the harbour is not such a serious difficulty, as the take-off distance is normally greater than the landing distance, particularly with aircraft such as

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will be used which will alight at a considerably reduced weight due to the consumption of most of the large fuel load.

Another method which, it is reported, will shortly be tried experimentally on the North Atlantic route is the "Mayo Scheme," where a small, highly loaded aircraft for mail carrying is taken off by means of a larger, lightly loaded machine. The Trans-Atlantic mail carrier is mounted on top of the parent machine and both take off and climb together. When sufficient altitude has been reached the two are separated, and the smaller aircraft continues its flight while the parent machine returns to the base. There it may be used for a further launch or else as a short-distance freight carrier. In the present design the upper component is a seaplane, that is, it is fitted with floats, so that it may alight or take off when lightly loaded from sheltered harbours, while the lower component is a flying boat very similar in outline to the Short "Empire" flying boats now being used by the Imperial Airways on the Empire Air Routes. The scheme is a novel and extremely interesting one, and the first flights of this aircraft will, no doubt, be watched with considerable interest both at home and abroad. There appears to be no reason to doubt that the method will be successful, but there are a number of authorities who doubt whether it is economic.

Another method which has been suggested is to add most of the fuel load to the aircraft when it has taken off by means of a second aeroplane, which acts as a tanker. This method has been used experimentally with what is believed to be reasonable success, but the difficulties of using it for Trans-Atlantic flights are considerable, and it is doubtful whether the added element of risk would be allowable. The two machines must establish contact in the pair, pass a fuel pipe from one to the other, connect up and then keep station while the fuel is pumped from the tanker to the other aircraft. This operation, although difficult, is certainly not impossible, but it involves a certain amount of risk, particuarly if the air is not calm. The time taken will be considerable, as a fair-sized Trans-Atlantic aircraft will need from 2,000 to 3,000 gallons of petrol.

FLOATING AIR STATIONS.

A fourth and very ambitious scheme is to build one or more floating islands called "seadromes," which would be moored in mid-Atlantic on the great circle route between, say, London and New York. The idea has been worked out in considerable detail. The proposal is to build large floating islands about 500 feet long and 150 feet wide upon which aeroplanes could alight as they do now on naval aircraft carriers. The difficulty of the movement of the "seadrome" due to the waves is to be overcome by building it on pillars, which extend downwards to the floats supporting the structure which are in the undisturbed water well below the surface. The "seadrome" is to be moored to a large buoy, so that it will swing to the wind, thus allowing aeroplanes to land and take off directly into the wind, as is essential in any scheme of this type.

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The "seadrome" would carry large stocks of petrol, oil and provisions, so as to be independent of the supply vessels for a long time. It would be fitted with a light and radio beacon as well as the normal wireless transmitting and receiving sets. A more ambitious model is U-shaped and encloses a portion of comparatively calm water for the use of supply vessels or passenger tenders. Landplanes would alight and take off from one of the decks forming the sides of the U, the other being used as a tank for seaplanes or flying boats.

Some research has been done on the problems of flotation and anchorage, and the construction of the "seadromes" appears to be simply a problem of heavy engineering comparable in difficulty to the building of a large bridge. If "seadromes" of this type could be placed at distances of, say, 500 miles, the paying load of Trans-Atlantic aircraft could be greatly increased, as fuel for, say, 750 miles (to allow a margin for head winds) need only be carried. In a typical design for a Trans-Atlantic land aeroplane weighing about 30,000 pounds this would increase the pay load from, say, 2000 pounds to about 10,000 pounds, an increase which would materially increase profits, even allowing for heavy landing dues. The difficulty of establishing a chain of these islands is mainly financial, as the cost would be high. In addition, there remains the question of their defence in war-time; their large size and the inflammability of the fuel and oil stocks that they would carry would render them very vulnerable to attack by sea or air and very difficult to protect.

STRATOSPHERE FLIGHT.

Another, though at the present time a somewhat remote possibility, is the use of stratosphere aircraft. At high altitudes of, say, 40,000 to 50,000 feet, the air is only about one-quarter sea-level density, which has the effect of reducing the drag on an aircraft, and so considerably increasing the speed and range if sufficient power can be obtained. The engine must be supplied with air which has been compressed in several stages and preferably cooled between each stage of compression; and the pilot, crew and passengers must be warmed and supplied with oxygen under pressure. For flights of short duration pressure suits have been used successfully, but for long distances, and certainly if passengers are carried, air-tight cabins with compressors and oxygen supply are essential. For flights at higher altitudes still, rocket propulsion might be used and the speed of flight would then be very high. Stratosphere flight is essentially only economic for long ranges, where the time taken in climbing to the operating height may be regained by the very high cruising speeds that are there possible. There is little doubt that stratosphere flight will be used at some time in the future for Trans-Atlantic flight, probably for fast mail planes; but the possibility of passenger flight by this means is more remote. The advantages to be gained are considerable and the flight from London to New York could be made non-stop at a very high cruising speed.

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CURRENT PROJECTS AND PREPARATIONS.

Great Britain, the United States of America, Germany and France are all preparing for the operation of regular Trans-Atlantic air services. In the House of Commons in August last Sir Philip Sassoon made an announcement on the subsidy scheme which has been agreed between the Governments of Great Britain, Canada, Newfoundland and the United States of America. The main points of the statement were that a joint operating company was to be formed incorporating three companies, one nominated by the Government of Great Britain (Imperial Airways), one nominated by the Irish Free State, and one by the Canadian Government. The capital of the joint company would be subscribed 51 per cent. by the United Kingdom Company, 24½ per cent. by the Irish Free State Company, and 24½ per cent. by the Canadian Government. Pan-American Airways would be given landing facilities by the United Kingdom, the Irish Free State, Newfoundland and Canada, and would participate in the operation of the services in return for landing facilities to be granted to the company by the United States Government. In operating the services preference would be given to the direct route from England to America by way of the Irish Free State, Newfoundland and Canada, but it was expected that in the initial period it might be necessary to fly via Bermuda during the winter months (presumably because of the difficulty of fog on the northern route). Experimental long-distance flights would shortly be made by Imperial Airways and Pan-American Airways, the results being placed at the disposal of the joint company when it was formed. The experimental flying would be financed by the Government of Great Britain, and the joint company would receive an annual subsidy when it assumed responsibility for flying operations. Of this subsidy Canada would contribute 20 per cent. (subject to a maximum of £75,000), the Irish Free State 5 per cent. (subject to a maximum of £12,000) and Newfoundland a sum to be later agreed; the remainder being made up by the Government of Great Britain. The four Governments concerned had agreed to provide landing, radio and meteorological facilities to the joint company. An inter-Government committee on Trans-Atlantic air services would be formed consisting of four members nominated by the Governments of Great Britain, Canada, the Irish Free State and Newfoundland respectively, to which all questions affecting national or international policy would be referred for decision by unanimous vote.

A similar statement was made in the Dail, and Mr. T. Derrig said that the Free State Airport would be constructed, owned and controlled by the Free State Government, and would provide all necessary radio and meteorological equipment as well as facilities for flying boats and landplanes.

Since these announcements considerable work has been done in preparing bases at Kilconry and Rynanna, in the Irish Free State, and at Hatties Camp and Botwood, in Newfoundland, and experimental flights are expected to start shortly. It is stated that a

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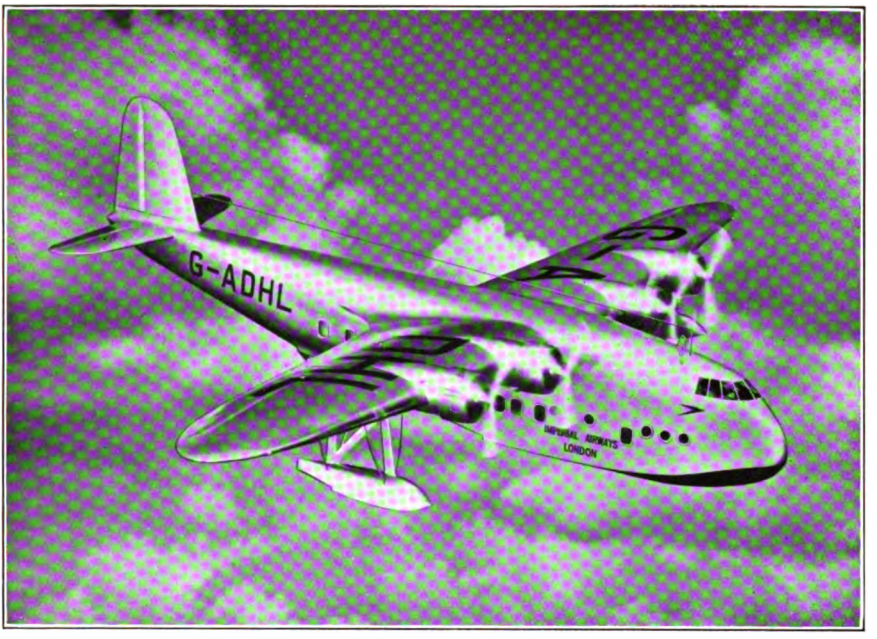

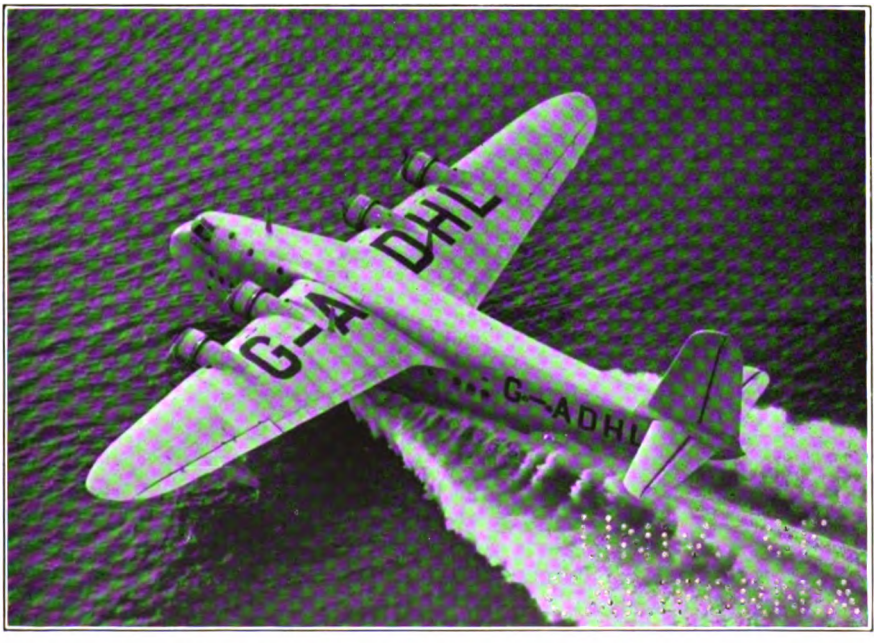

THE NEW EMPIRE FLYING BOAT CANOPUS.

Built by Messrs. Short Bros., Rochester.

(Photos by courtesy of Imperial Airways and "Flight.")

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regular bi-weekly service should be running within three years, carrying passengers and mail, the approximate times being 16 hours eastward and 22 hours westward. The first of the Empire Flying Boats built by Short Bros. for Imperial Airways are now flying on the Empire Air routes, and two similar boats have been built with long-range tanks for Trans-Atlantic flight. As the Empire boats cruise at 160 m.p.h. and have a top speed of 200 m.p.h., they represent a considerable advance on previous machines and may be expected to give very good service on the Empire routes to South Africa and Australia. One of these boats has also been shipped to Bermuda to inaugurate the Bermuda to New York service in conjunction with Pan-American Airways. The all-up weight of these aircraft is 40,500 pounds, and they carry a crew of five and a pay load of 7,200 pounds, consisting of passengers, luggage and mails. With this loading the range is about 760 miles at a speed of 160 m.p.h. The two boats intended for Trans-Atlantic flight are not fitted for passenger accommodation, but instead have greatly increased tank capacity. The all-up weight has been increased to 45,000 pounds by allowing a longer take-off time, and the range is then about 2,500 miles against a 40 m.p.h. head wind when cruising at 160 m.p.h., which is equivalent to approximately 3,300 miles in still air. The load carried is 1,000 pounds of mail and a crew of three. The Mayo Composite aeroplane should be flying during the summer and will probably be used experimentally on the Newfoundland Route. In addition, two four-engined landplanes, now being built by the De Haviland Aircraft Company to Air Ministry and Imperial Airways requirements, are nearing completion, and should be flying shortly. These are high-speed mailplanes, and will no doubt be used on the Newfoundland route.

GERMAN PLANS.

Abroad there is similar activity. In Germany it is stated that the recent flights via the Azores and Bermuda by flying boat have been most encouraging, and that it is probable that a regular service will be operated in 1937 by way of Lisbon, the Azores and New York, for which service a new catapult ship is being built. The interesting point about the experimental flights which have been made during the past year is the use of aircraft fitted with engines burning heavy oil instead of petrol. The use of this fuel of course reduces the fire risk, but the main reason for its use is the increased range that is stated to be obtained. The heavy-oil engine has a lower specific consumption than the normal petrol engine—that is, it burns a lower weight of fuel than the petrol engine of the same power—but due to the very high pressures that are used the bare weight of the engine is greater. For short ranges the extra engine weight is evidently a disadvantage, but if the range is long the reduced weight of the fuel outweighs this handicap; the result is that the aeroplane with the heavy-oil engine has the greater range. Authorities differ on the question as to the exact

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point at which the heavy-oil engine begins to show an advantage, but it is probable that the ranges of about 2,500 miles required in Trans-Atlantic flight are sufficient at any rate to establish equality of weight, even if no saving is shown in comparison with modern high-compression petrol engines. The Zeppelin service is to be increased, and the *Deutsche Zeppelin Reederei* has decided to build three new airships for the North Atlantic route, in addition to the LZ130 now in construction at Friedrichshafen.

FRENCH PLANS.

France is also preparing for Trans-Atlantic air services, and on December 2 an announcement was made in the Chamber of Deputies that sixty million francs (about £600,000) had been allotted for the formation of a Trans-Atlantic Company with representatives from Air France, the French Line (steamships) and the State. The State would have control by virtue of being the largest stockholder, and international agreements would be entered into to avoid clashing with foreign interests. Two routes were to be used, one by the Azores and the other, for summer traffic only, by Brest to St. Pierre, Newfoundland, at both of which seaplane bases would be constructed. It is interesting to note that France is at a disadvantage on the Newfoundland route, as the distance from Brest to St. Pierre is about 300 miles greater than from Rynanna to Botwood, Newfoundland.

AMERICAN PLANS.

The United States of America are to participate, as has already been explained, in the British services via Newfoundland and Bermuda, and in this connection it is probable that the experience that Pan-American Airways have gained in their operation of the Trans-Pacific service during the past year will be of considerable assistance in the inauguration of the Atlantic air route. In addition, it is expected that an American airship service will be started within the next few years. In August last a committee of the Business Advisory Council of the Department of Commerce issued a report recommending a number of steps to be taken towards the establishment of a regular airship service. These include the granting of funds to construct an East Coast airship ground for Trans-Atlantic airships and to build suitable commercial rigid airships. It also recommended that the U.S. Naval Air Service should co-operate by research work on airship designs, and on suitable heavy-oil engines of from 1,500 to 2,000 h.p., and should initiate a training programme by which a number of Reservists could be made available for commercial operation.

SUMMARY.

From the foregoing brief description of the methods available for Trans-Atlantic flight and the preparations that are now being made for regular services, it will be seen that considerable

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developments in Trans-Atlantic air services may be expected in the near future. The importance of these services can hardly be exaggerated. In a few years Canada and America may be brought within a day's travel of England, a fact which should improve the understanding between the countries and bring increased trade. The comfort of the passenger aircraft will, of course, be important, for while travellers will endure discomfort for an hour without complaint, any imperfection such as noise, draughts or poor ventilation will cause a bad impression if it is experienced for, say, 16 hours. This point is evidently being carefully considered, for it is stated that the relatively short-range Empire boats are as quiet as and more comfortable than the ordinary long-distance train.

TECHNICUS.

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CHAPTER XIV.

Empire Flying-Boat Routes.

For many years there has been only one British commercial air service operated by flying boats, namely the service across the Mediterranean from Brindisi to Alexandria by way of Athens. This state of affairs has aroused some curiosity in those familiar with shipping. It has always seemed natural that air services to the British Empire should develop rather by the use of flying boats than by land aircraft, and it has so frequently been claimed that the sea provides so many natural "aerodromes" for flying boats. The recent announcements that twenty-eight large flying boats are under construction for the Empire Air Mail Services have accordingly awakened great interest. One of these aircraft, carrying over half a ton of Christmas mail to England, made a non-stop flight from Alexandria to Marseilles, about 1,700 miles, and led one writer in the daily Press to suggest that the conquest of the Atlantic is just round the corner, because the flying boat, on arrival at Marseilles, had enough fuel left for several hours' more flying. It is known that whereas Imperial Airways has under construction twenty-eight flying boats, only twelve large land aircraft are at present being built. The causes underlying the change from a fleet of preponderatingly land aircraft to one in which flying boats out-number the land aircraft are worthy of consideration.

As is generally known, Imperial Airways was established in 1924, and was charged by the Government with the duty of developing British air transport to a self-supporting basis at the earliest opportunity. The agreements under which its services have been operating since 1924 are now drawing to a close, and careful consideration has been given over the past few years to the line of development that should be followed after the expiry of the existing agreements. The experience of the last ten years has clearly shown that very important reductions in cost per ton carried are to be looked for through increase in size of aircraft, and to their intensive employment. As is well known, Imperial Airways have been the pioneers in the use of large aircraft since the inception of their Company, and many advantages are now known to be dependent on size, namely a high standard of comfort, quietness, and the provision of a full catering service, as well as reduction in cost per passenger mile or ton mile. Further, traffic that would not have been attracted to the air at all by small and less comfortable aircraft has now been converted by large and comfortable aircraft to regular use of the air; and the travelling public has now come to look upon air services as a

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normal means of transport and not merely as an adventure. The combination of falling costs and rising patronage, permitting of reduction in fares while achieving a lower cost per ton carried, brought the carriage of mail by air without surcharge within the realm of practical politics at the time when the Government were considering the lines of development to be followed after the termination of the present agreements. It is perhaps a cause for satisfaction that this stage should have been reached at a time when the Government were able to take full advantage of the progress made in air transport in the interests of the Empire; and it is a matter for congratulation that the Government seized the opportunity.

On December 21, 1934, the Under-Secretary of State for Air announced in the House of Commons that the Government had decided, subject to the co-operation and support of all the other Governments concerned, to make arrangements under which Empire air communications would, in the future, be developed on the following lines:—

(1) A very material improvement would be made on present schedules between the several parts of the Empire concerned.

(2) A substantial increase in the frequency of the services would be achieved.

(3) All first-class mail to the Empire countries covered by the projected services would be in future carried by air.

The scheme envisaged a schedule of just over two days to India, two and a half days to East Africa, four days to the Cape, four days to Singapore and seven days to Australia. Provision was to be made for four or possibly five services a week to India, three services a week to Singapore and to East Africa, and two each to South Africa and Australia. In making this announcement, the Under-Secretary added that he was not able to say anything definite about the letter rate of postage, but it was hoped that for letters posted in the United Kingdom it would be about the present Empire rate of 1½*d.*, but this was to apply to the first half-ounce instead of the first ounce as at present. He pointed out that correspondence covering at least eight sides of special light-weight paper could be sent within the half-ounce limit. In conclusion, the Under-Secretary said that a comprehensive programme for the development of ground organisation which would enable the Empire services, catering for passengers as well as mail traffic, to operate by night as well as by day, would be undertaken, and he characterised the project as the largest step forward which had yet been taken in the development of Empire air communications. This development is, of course, dependent upon great reduction in cost per ton-mile carried, which, as has already been pointed out, depends partly on increasing the size of the individual craft employed.

The scheme was the result of a general investigation into the economic aspect of the employment of larger aircraft than those at the present time employed, and a special inquiry into the benefits that would accrue from the employment of a very much greater proportion of marine aircraft than had hitherto been used. Increase in the size of aircraft adds a new difficulty to land aircraft, but

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reduces one of the main difficulties incidental to the operation of marine aircraft, and in this lies the key to the change over from land aircraft to marine aircraft to operate some of the Empire services. It may now be taken for granted that with four-engined aircraft that can fly on the normal power of three of their engines, no difference in risk is involved in flying land aircraft over water or marine aircraft over land, and the choice between land and marine aircraft is determined more by the available airports than by the nature of the land or water to be flown over.

With increase in size of land aircraft, the problems of building the under-carriage and aerodrome surfaces to stand the weight assume major importance. While it is possible to build aircraft under-carriages to support 18 to 20 tons on two pneumatic-tyred wheels, it is becoming increasingly difficult, as well as very costly, to prepare aerodrome surfaces that will support this weight in all weather conditions. If cost is of no importance, it is obviously possible to make concrete runways with an adequate foundation which will support any weight of land aircraft that can at the moment be visualised, but there are territories on the Empire routes that are subject to excessive rainfall, where aerodromes are liable to become unserviceable even for our present aircraft. At many of these places, no natural materials and no skilled labour for the construction of runways are available, and the cost of importing the material and necessary labour to improve them to take still larger aircraft would make them of prohibitive cost for the present density of air traffic.

There is therefore an economic limit to the size of land aircraft than can be used in such territories, in view of the increased weight of foundation that would be required for the necessary runways for take-off and landing. The same problem does not arise in the case of flying boats, as no limit whatever is imposed on the size of craft that can be supported by water displacement. Moreover, every increase in size makes marine aircraft more, and not less, sea-worthy, and increases their ability to operate in unfavourable conditions of wind and sea. For large flying boats, then, if a sufficient area of reasonably sheltered water is available, no further cost whatever need be involved in the construction of new, or improvement of the existing, landing area to keep pace with increases in size of aircraft. Provided, therefore, that the necessary loads are available, flying boats appear to hold out better prospects of low carriage costs than do land aircraft.

Another factor which is favourable to flying boats is that they will ride at their moorings and turn into wind automatically. They can, in fact, remain with safety entirely in the open. Land aircraft do not automatically turn into wind when they are at rest on the ground, and, generally speaking, land aircraft have to be housed when not on service. It can be argued that land aircraft can be tethered or moored on an aerodrome with safety, but the fact remains that in such circumstances they are more liable to suffer from the effects of wind than are flying boats riding at their moorings. It is perhaps noteworthy that none of the marine aircraft employed

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by Imperial Airways on the Mediterranean service since it began in 1928 has ever been in a hangar.

Flying boats do, however, suffer certain minor inconveniences, and in particular access from the shore to the flying boat requires small surface craft, or some form of pier or embarkation platform. No equivalent difficulty arises in the use of land aircraft, to which passengers may walk and vehicles may approach without hindrance. This, however, is a comparatively minor matter, and does not swing the balance of advantages in favour of land aircraft.

Generally speaking, marine aircraft will be able to take their fuel aboard at sea-board prices, which offer a marked economy compared with the cost of refuelling at inland aerodromes. Petrol is a commodity used very largely for road transport, a form of transport that competes with railways ; it is also a somewhat special class of freight, and it is therefore not surprising that rates for the conveyance of oil fuel by rail are very high. The handling, in addition, involves a certain amount of waste and expense in packing, or the provision of special vehicles. At many points on the present Empire routes, the cost of fuel is doubled by the cost of transport from the coast to inland aerodromes. These, then, are some of the advantages that may be secured by the employment of flying boats in preference to land aircraft, if no countervailing disadvantages appear when we seek to use them on the present Empire routes.

The African Route.

Taking first the Africa route, from a marine port on the South coast of England, it is possible to fly overland to Marseilles via Macon on the Saône, and from there our route to Egypt is already a coastal route. We hope to obtain permission to use a suitable marine airport near Rome, and we already have permission from the Italian Government to use Brindisi. The passage over Greek territory and territorial waters is equally convenient, and no difficulty over marine airports arises as far as Egypt.

From Alexandria to Lake Victoria in Central Africa, flying boats can follow and land on the Nile. This route was in fact used in 1931, when the service was established to Central Africa. It is true that problems arise at certain points when the river is in flood and sudd is carried downstream. It is equally true that at other points the water may become comparatively shallow and limit the areas on which landings may be made. This terrain, however, holds equally formidable if not greater difficulties for aeroplanes, and when the river is in flood the greatest difficulty is encountered in maintaining satisfactory aerodromes along the upper reaches of the Nile. At two places on the Nile the Company has already had to build runways. At one of them no local stone is available for foundation purposes.

Incidentally, it may be mentioned that an echo sounder, such as is in common use for checking the depths of water in marine harbours, is being used to ascertain the depth of water available at certain points on the Nile. In this case, however, we need only to think in

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depths up to 10 feet at low water, but the particular apparatus we are using has been made to record from zero to about 14 feet.

As the source of the Nile is approached, the level of the water gradually rises until at the surface of Lake Victoria a height of 3,726 feet above sea-level is reached. From this point to Johannesburg, Africa is an elevated plateau mostly from 4,000 to 5,000 feet above sea-level, and the route at present followed by our existing service to Johannesburg has to operate from aerodromes between these altitudes. With every increase of altitude, the power developed by the aircrafts' engines is reduced, and higher speeds are necessary to secure the same lift. As a result, aircraft operating from these high-altitude aerodromes need larger aerodromes with better surfaces and to have a performance which at sea-level would be extravagant. The flying-boat route avoids this latter difficulty.

From Kisumu, the route passes over Lake Naivasha to the coast at Mombasa. From there it follows the East African coast via Dar-es-Salaam and Lindi in Tanganyika Territory, and Mozambique, Quilemane, Beira, Inhambane and Lourenco Marques in Portuguese East Africa. From there it goes into the territory of the Union of South Africa to the terminus of the route at Durban.

The present land route will still be maintained for the sake of local mail, and connection with the main route will be made by land aircraft from Kisumu to Nairobi and from Beira to Salisbury and Blantyre. The main bulk of the traffic passing between the Union of South Africa and Great Britain will, however, not have to be carried over the African plateau from Kisumu to Johannesburg, but will be able to operate via the coast route at sea-level. The arrangement is convenient also from the point of view of the Union of South Africa, which has developed its own internal services, and will be able to distribute throughout the Union by air the mails that are brought to them by the main trunk route.

The Indian Route.

The India service will continue to be operated partly by land aircraft, but as far as the flying-boat operations are concerned, the same ports of call will be used between Great Britain and Egypt. From the Mediterranean to the Persian Gulf a long jump over inhospitable territory without water is involved, but there is, however, convenient inland water on either side of this desert sector. In Palestine, there is the Sea of Galilee and the Dead Sea on which flying boats could refuel. Not far from the Euphrates at Baghdad is Lake Habbaniyeh, which forms a convenient marine airport before open water is reached at the head of the Persian Gulf at Basra. From there to India, the coasts of the Persian Gulf are followed. From Karachi to Calcutta another overland section has to be negotiated.

India, however, provides sufficient inland lakes and rivers to make possible the continuance of the flying-boat route to Calcutta, and from there to Singapore the coast is followed, and much less difficulty arises in obtaining satisfactory marine airports than in

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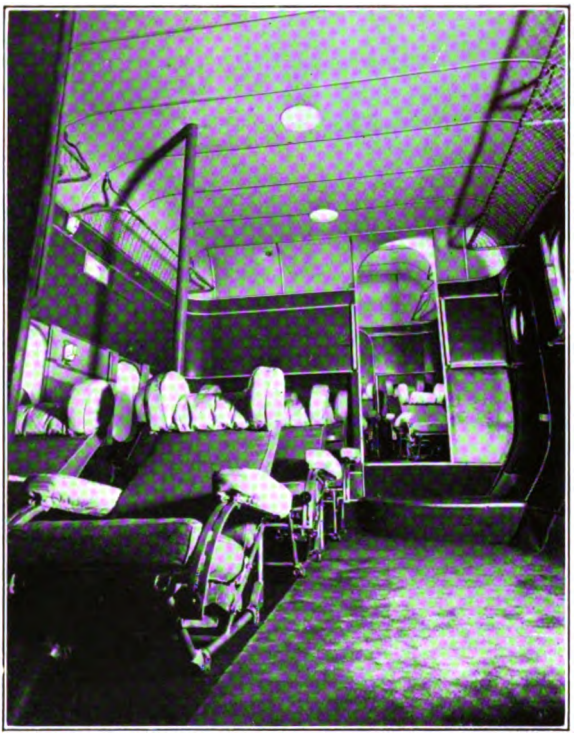

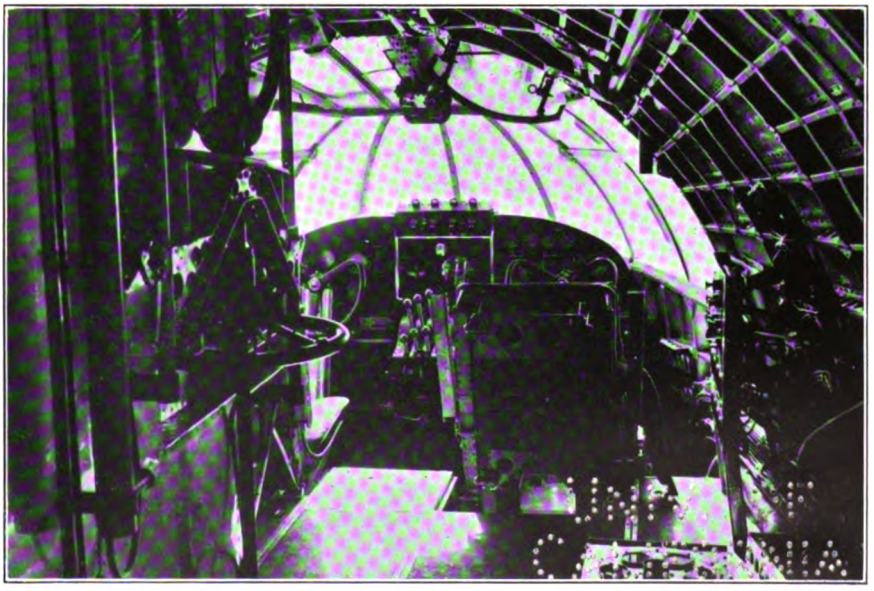

THE NEW EMPIRE FLYING BOAT CANOPUS.

(Above) Part of the Promenade Saloon, showing Aft Cabin.
(Below) The Bridge and Control Positions.

(Photos by courtesy of Imperial Airways and "Flight.")

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providing land aerodromes. This part of Asia is subject to monsoon conditions, and the maintenance of satisfactory aerodrome surfaces during the monsoon is difficult and extremely costly.

The Australian Route.

From Singapore to the coast of Australia is a natural flying-boat route, passing as it does through the Netherlands East Indies archipelago via Klabat Bay, Batavia, Sourabaya, Bima and Koepang to Darwin. From the North-West coast of Australia to the main areas of business activity in the South-East, either a landplane route or a flying-boat route is possible. The Northern coast-line of Australia is but little known; settlement is scarce, and from some points of view the route is uninviting. Surveys of the coast, however, have shown it to be entirely practicable for flying-boat operations. On the other hand, the inland route is already in operation, and the air service has now become a necessity to the settlers in the territory between Brisbane and Darwin. There has accordingly arisen some difference of opinion as to which is the better plan to follow, and the choice becomes more a political than a technical matter.

There seems no doubt, however, that the flying-boat route is entirely practical. From Darwin the flying boats would fly overland to the mouth of the Roper River where it flows into the Gulf of Carpentaria, and then along the Southern coast of the Gulf of Carpentaria over Vanderlins Island, Wellesley Island to Karumba at the mouth of the Norman River. From Karumba, in the South-East corner of the Gulf, the route then lies over 350 miles of land to the coast of Queensland at Cardwell, 90 miles North of Townsville. From here the Eastern coast of Australia is followed via Rockhampton, Gladstone and Brisbane to Sydney. This route is approximately the same mileage as the inland route.

New Zealand.

At the moment, no service is in operation to New Zealand, but such a service would seem to be a natural extension of the England/Australia service, and it would seem equally natural to expect to operate it by means of flying boats from either Sydney or Brisbane to Auckland.

Feeder Services.

There are two other important branch services to the main Empire routes at the moment in operation. One is from Penang to Hong Kong, and this could, with equal convenience, be operated by means of flying boats as by aeroplanes, but a service from Singapore by way of British North Borneo and the Philippines to Hong Kong appears to be an eminently desirable route for development by flying boats. The other feeder service at present in operation is that from Khartoum to West Africa, and this does not, of course, lend itself to operation by marine craft. It may be described as a desert route, and will therefore remain distinct and separate from the flying-boat services.

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It is generally known that one of the same type of flying boats as is used on the Empire routes is now at Bermuda, where it will operate alternately with aircraft belonging to Pan-American Airways a service between Bermuda and New York. This service may, perhaps, be regarded as the first link in the Atlantic chain, and the completion of the Atlantic service will be the next big development in British civil aviation.

The Canadian Route.

In the House of Commons on July 30, 1936, the Under-Secretary of State for Air announced that discussions had taken place during 1935 between representatives of the United Kingdom, Canada, the Irish Free State and Newfoundland, regarding the establishment of an air service across the North Atlantic. Discussions also took place immediately after the Conference in Ottawa with the representatives of the United States' Government in Washington, with a view to ensuring the fullest measure of understanding and co-operation with the United States in the development of trans-Atlantic flying. As a result, understandings were reached, based upon the principle of full reciprocity, which the Under-Secretary of State hoped would bring about as soon as practicable the establishment of trans-Atlantic air service. The main details of the arrangements agreed upon between the respective Governments were as follows :—

(1) A joint Operating Company, which will be responsible for carrying on the services, will be incorporated at the instance of three Companies, of which one will be nominated for that purpose by the Government of the United Kingdom, one by the Irish Free State Government and one by the Canadian Government.

(2) The capital of the Joint Company will be subscribed and held as to 51 per cent. by the United Kingdom Company, 24½ per cent. by the Canadian Company and 24½ per cent. by the Irish Free State Company.

(3) In return for landing facilities to be granted to the Joint Company by the United States Government, Pan-American Airways will be granted landing facilities by the Governments of the United Kingdom, Canada, the Irish Free State and Newfoundland, and that Company will participate on a basis of reciprocity with the Joint Company in the operation of the services.

(4) All practical preference will be given to the direct route from the United Kingdom via the Irish Free State, Newfoundland and Canada, but it may be necessary, during the initial period, to operate the services via Bermuda during the winter months.

The Under-Secretary of State for Air went on to say that experimental long-distance flights and other necessary investigations would be carried out in the near future, and that as the incorporation of the Joint Company would involve some delay, it had been arranged that experimental flights and investigations should be conducted by Imperial Airways.

The decision of the interested Governments to give all possible preference to the route via the Irish Free State, Newfoundland and

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Canada focuses attention on this route, and upon the airports that are now under construction at Foynes on the Shannon, and at Botwood in the so-called fog-free zone in Newfoundland. The route to which preference is to be given is the shortest, but nevertheless involves an ocean crossing of roughly 2,000 miles. It also traverses an area liable to suffer from bad weather, and at the western end traverses an area notorious for fog. In addition, during the winter, ice formation conditions are prevalent and marine harbours in Newfoundland and Canada may be either frozen over or made impracticable by the presence of floating ice. The use of this route all the year round is complicated by the fact that during part of the year marine airports at the western end are certain to be frozen over, while open water persists at the eastern terminals.

Of the two alternative routes, the northerly via Iceland and Greenland suffers equally from severe weather conditions and frozen harbours, is 1,000 miles longer, but has no stage necessarily longer than 500 miles. Although providing the great advantage of short stages, however, the Northern route suffers under almost continuous darkness during the winter ; in other respects it is a most inhospitable route for which it is almost impossible to obtain sufficient meteorological data to ensure accurate forecasts of weather conditions.

The other, the southerly route via the Azores and Bermuda, traverses an area of much better weather, but while there is a splendid area of sheltered water at Bermuda, there is no natural protection in the Azores. The route also suffers from one ocean stage of 2,000 miles from the Azores to Bermuda, another of 1,000 miles from the Azores to Portugal, and a third from Bermuda to the American coast of over 700 miles. In total, this route is nearly 2,000 miles longer than the direct route.

Many methods have been proposed for dealing with the ocean crossings, and it must be borne in mind that the actual mileage does not give a full picture of the difficulty of the ocean stages. On the North Atlantic there are prevailing winds blowing from West to East, and their force may average 45 m.p.h. for the whole distance, and may even reach 60 m.p.h. The problem of the Atlantic, therefore, is basically that of obtaining adequate range against the prevailing winds, and at the same time to carry a pay load that shall make the enterprise worth while.

Various suggestions have been put forward for solving this problem, and have been argued with great force by their respective protagonists. Some pin their faith to the further development of the orthodox flying boat such as that to be used on the Empire services ; others support the claims of land aircraft, which they hold will have less head resistance than an equivalent flying boat carrying the same load. Others again, to meet the difficulty of launching a heavily loaded aircraft, favour some form of assistance for the take-off. Among such forms of assistance are catapults, which have already been used with considerable success. The initial acceleration, however, seems to debar their application to ordinary passenger services, as it is unlikely that passengers in general will be able, or willing, to endure the acceleration entailed.

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Another means of assisting the take-off of heavily loaded aircraft is by launching the long-distance aircraft by means of a carrier aircraft, an arrangement usually referred to as the Mayo Composite aircraft. This method is equivalent in effect to a catapult at high altitude. It holds out the prospect of doing everything that the catapult will do, and without the disadvantages of the catapult, which are :—

(1) Launching a heavily loaded aircraft close to the ground; and

(2) Involving the acceptance of high acceleration, which appears to restrict its application to services that do not cater for passengers.

Moreover, the composite aircraft is mobile, and the lower component can be used if desired for other purposes in addition to launching the long-distance aircraft.

Still another method of overcoming the difficulty of getting a heavily loaded aircraft safely into the air is to add its fuel load after the take-off. Refuelling in the air appears to have considerable potentialities, and recent experimental work has been very encouraging. The difficulties that may arise in bad weather are obvious, but as the method is only in its infancy, there seems every reason to expect that they will largely be avoided or overcome as further experience is accumulated.

The provision of artificial islands has for some time appeared technically possible, but financially would add a very serious burden to trans-Atlantic services until a high density of traffic is achieved. Their mooring in the Atlantic appears to present one of the major problems, and their status in the event of war would produce a novel problem. The developments in aerodynamics during the last few years would appear in any case to render floating islands, on which enormous expenditure would be involved, less attractive than the other alternative methods of securing the required range. Even to make one trial "seadrome" involves a gamble of great magnitude.

The use of ships in place of floating islands has already been shown to have valuable application where weather and sea conditions are favourable. It seems doubtful, however, whether the North Atlantic can be conquered in this way for an all-the-year-service, however successfully it may have been applied on the South Atlantic.

In this method the flying boats land in the open sea, taxi on to an apron that is trailed behind the ship, and are then lifted on to the ship by means of a crane. After refuelling, they are catapulted off the ship for the next sector of the journey.

The North Atlantic probably provides the ocean route offering the greatest density of high-grade traffic anywhere in the world, but from the aeronautical point of view the crossing is more difficult than either that of the South Atlantic or the Pacific. Although the problem is so much harder to solve because of prevailing weather, the solution will be the more valuable when it is achieved. From the British Empire point of view, it is undoubtedly of more importance than either the South Atlantic or the Pacific, but the British Empire obviously has special interests in the Pacific, and a service from Canada by way of Hawaii and Fiji to New Zealand, there to connect

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with the service from New Zealand via Australia to Great Britain, is an obvious development that must be undertaken within the next few years. When that route is completed, there will be a regular British service entirely encircling the globe, but one section of it will probably be operated by land aircraft, namely the Trans-Canada section.

H. BURCHALL.

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CHAPTER XV.

The Fleet Air Arm.

A MIDDLE VIEW.

How, in one house,
Should many people, under two commands,
Hold amity? 'Tis hard, almost impossible.
King Lear, II, iv.

The question of the control and organisation of the Fleet Air Arm has been discussed between the Admiralty and the Air Ministry for many years past. The subject has formed a perennial bone of contention between the partisans on either side in the Press and in articles in Service journals, sometimes dying down to seeming quiescence only to flare up again with renewed vigour. Some account of the present position and past history of this question, by one who has given much attention to it, may therefore be of interest.

During the last War little use was made of naval aircraft working with the Fleet. The modern aircraft carrier is a post-war development. Flying off, and more particularly landing on, the deck of a ship was still in its very early experimental stages at the end of the War. Such machines as were available for use with the Fleet were mostly seaplanes, of doubtful reliability and uncertain performance. Although by 1918 the Royal Naval Air Service had grown to considerable size and importance, its energies were largely devoted to non-naval duties such as bombing and fighting in France. Such naval duties as it undertook were confined to coast patrols and convoy and anti-submarine work in narrow waters. The aeroplane was not then, as it has since become, an essential part of the equipment and organisation of the Fleet. Apart from their use on local patrol duties, aircraft, or the lack of them, had little or no influence on the conduct of the War at sea.

Thus the formation, in 1918, of the Royal Air Force by the amalgamation of the Royal Flying Corps and the Royal Naval Air Service left the Admiralty comparatively unmoved. Those portions of the Air Service that were employed on local naval duties continued on those duties with but little alteration beyond the outward changing of uniforms and ranks. Ship-borne aircraft were so few in number and so limited in scope (judged by modern standards) that the change passed almost unnoticed by the Fleet at sea.

With the advent after the War of the flush-decked aircraft carrier the situation changed rapidly. These ships provided full facilities for flying off and landing on, together with ample hangar accommodation and full resources for the maintenance of the

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aeroplanes on board. For the first time aircraft were able to accompany the Fleet at sea, ready for use when and where required without regard to geographical location. At once the aeroplane began to take its place as an integral part of the fighting organisation of the Fleet. Roles were allotted to the different types of aeroplanes according to their respective functions—bombing, torpedo attack, reconnaissance, etc.—in all the various war activities a fleet may be called upon to undertake.

At the outset all flying personnel in aircraft carriers was supplied by the Air Ministry from the ranks of the Royal Air Force. This included officer pilots and observers, and airmen for the "ground" maintenance of aircraft. This system was never satisfactory. In 1921 the first step towards "navalisation" was made by agreement between the two departments, that the duties of air observer with the Fleet should in future be undertaken by naval officers. The function of the naval observer is a highly specialised one, which had at that time no counterpart in the Royal Air Force and could not therefore be undertaken by Air Force personnel. This step by no means satisfied the aspirations of the Admiralty, who continued to press for a larger measure of control in the manning and handling of their own air resources.

In 1923 the whole question was investigated by a sub-committee of the Committee of Imperial Defence under the chairmanship of the late Lord Balfour. The recommendations of the Balfour Committee were accepted by the Government, and formed the basis of the Fleet Air Arm organisation which was introduced in 1924. (The title "Fleet Air Arm" was first used officially by this committee.) With slight modifications this organisation is still in force to-day. It is this which forms the subject of the present discussions between the two services—and between their respective partisans outside.

The organisation is in effect a compromise between two extremes. Like most compromises, it fails to satisfy the extremists on either side, and is no doubt susceptible of improvement in the light of experience. It is as well to remember, however, that the scheme is not altogether a one-sided one imposed by the Air Ministry single-handed on a reluctant Admiralty. It was approved by the Government as a whole and accepted by both sides as representing the best measure of agreement that could be reached at that time.

From the three aspects of personnel, operations and materiel the organisation may be briefly outlined as follows: 70 per cent. of pilots and 100 per cent. of observers of the Air Arm are naval officers. The remaining 30 per cent. of pilots are drawn from the Royal Air Force. The whole of the technical personnel required for the maintenance of the aircraft—*i.e.* fitters, riggers, armourers, etc.—is composed of airmen of the Royal Air Force. In trades which are common to the two services the majority of the personnel are naval ratings. The naval officer pilots are taught to fly at a special Royal Air Force flying school. The observers, similarly, are given their specialised air training in a Royal Air Force school established for this purpose.

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When embarked in their carriers or other ships the aircraft and personnel come under the orders of the captain of the ship for all purposes ; for operations they are entirely under the orders and control of the admiral or senior naval officer present. There is here no question of "dual control" or interference by the Air Ministry. When the carrier returns to her home port to refit or give leave the squadrons are disembarked to their shore bases. These are Royal Air Force stations, and as such are manned by the Royal Air Force and controlled by the Air Ministry. They are, however, specially organised for Fleet Air Arm purposes. All necessary facilities are provided for repairs and overhauls of aircraft ; and opportunity is given for the continuance of training on the lines required by the naval authorities.

So far as concerns materiel—supply of aeroplanes and equipment, whether to ships or shore bases—this is arranged by the Air Ministry in accordance with requirements notified by the Admiralty. It has been suggested that the aeroplanes supplied for Fleet Air Arm use are of unsatisfactory types, or are not so suitable for their work as they might have been had the supply been in the hands of the Admiralty. Whether or not there is any substance in this complaint must remain a matter of opinion. It is to be noted, however, that the Air Ministry are not their own designers. The aeroplanes are designed by the manufacturers to comply as far as possible with the specifications drawn up by the Air Staff. For naval aircraft the specifications are drawn up in close consultation with the Admiralty, and to meet their requirements. Unless the Admiralty propose to set up a designing staff of their own it is difficult to see how this system could be improved. The dangers of competition and duplication on the part of two Government departments in the sphere of aircraft production are too well remembered from the experience of the War to need emphasis. From this brief summary it will be seen that the Admiralty already have complete control of their own Air Arm so far as its operations are concerned, and to a large extent also its manning. The small measure of Air Force interest on the manning side of the present organisation is no doubt capable of further adjustment.

A more serious problem arises in the supply of pilots. The present system of using only officer pilots for Fleet Air Arm duties, whether R.N. or R.A.F., is undoubtedly extravagant. Naval officer pilots have the advantage that when not required for flying they can always be employed on naval duties. But already the number of pilots in a modern carrier exceeds the number that can be usefully absorbed in purely naval work. To meet the expansion that would be necessary in war would surely be beyond the resources of the Admiralty if supply were limited only to naval officers.

The employment of a proportion of Royal Air Force officers should be of help in creating a reserve of pilots trained in naval work, which might be most useful in an emergency. This would require that the pilots who are to form this reserve (*i.e.* officers either on the active list or the reserve with previous Fleet Air Arm

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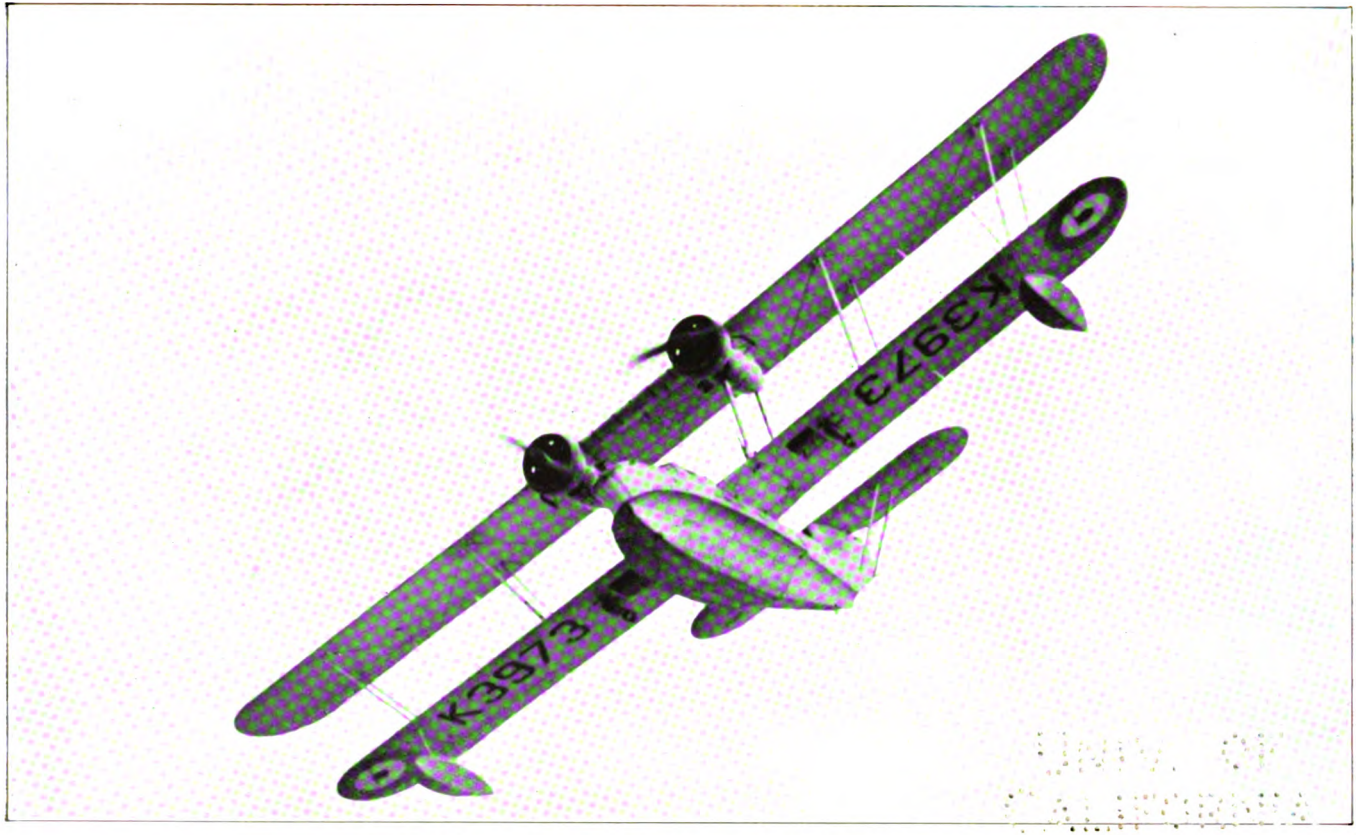

VICKERS' SUPERMARINE "STRANRAER" FLYING BOAT.

Bristol Pegasus Engines.

Operates as a self-contained unit for duty at home and overseas on naval reconnaissance, navigational, and service training flights, etc.

(By courtesy of Messrs. Vickers (Aviation) Ltd.)

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experience) be definitely earmarked beforehand and put at the disposal of the Admiralty when required. Unless a guarantee to this effect can be given (and the expansion of the Air Force now in progress makes this doubtful), the present system of employing Air Force pilots with the Fleet Air Arm has little to commend it. It merely robs the Air Force of a proportion of its officers without contributing anything to naval needs.

A solution might be found in the employment of "lower deck" pilots similar to the sergeant pilots used in the Royal Air Force. Already a number of the latter have been successfully employed with the Fleet Air Arm. There seems no reason why this system should not be extended to include naval personnel of similar standing.

No doubt this problem has already been considered. If the Admiralty are satisfied that it can be solved satisfactorily, there is no reason why it should unduly influence the decision on the main question.

It is said that the present system is disliked by those who have to work it, and leads inevitably to friction between the two services. Even Lord Trenchard, in a recent letter to *The Times*, writes that "to attain the best results of which the system is capable it requires a genuine determination on both sides to produce them." In practice there is very little friction between the working partners of the system in the ships or at the bases, chiefly because of that genuine determination of which Lord Trenchard writes. But in spite of this it is true that the system is unpopular in both services. Given bad will or a refusal to co-operate on either side, the system would be unworkable. It is unpopular in the Navy because the higher command dislikes feeling that its organisation and supplies are even partly dependent on another service; and because the junior officer dislikes feeling that his flying career is controlled by or at the mercy of an outside authority. (Naval pilots are given Royal Air Force commissions and depend for their flying advancement on promotion in Air Force rank. The commissions are, however, given chiefly to enable their holders to exercise disciplinary control over the airmen in their flights or squadrons, which they would not otherwise be able to do when landed at a shore base.)

The system is equally unpopular in the Air Force, because the Royal Air Force officer feels that when embarked in a ship, under naval discipline and control, he and his airmen lose all their identity as a separate service. That separate identity is a precious thing, won in the stress of war, of which the service is justly proud and jealous. In the course of years the methods and organisation of the Royal Air Force—all the small points of routine, discipline, custom and convention on which tradition builds itself—have naturally tended to diverge more and more from those of the two older services. In a ship the Air Force is swallowed up by naval methods and routine, and all the small points of difference are lost. Small points, these; yet they mean much to the welfare and happiness of the officers and men, and must in the end react on the efficiency which is itself so largely dependent on the well-being of the personnel.

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The Navy does not man the guns of the coast defence batteries or "fixed defences" which are provided to protect our ports. The sole duty of these fixed defences is to destroy any enemy vessels which may approach our harbours. This is as much a "naval" duty as is that of a squadron of shore-based aeroplanes employed on the same errand. Yet this is only one of the many possible functions of the aeroplanes. Why, then, should the Navy man the latter in preference to the former?

The solution suggested is to give the Navy complete control in all respects of all aircraft embarked in ships, together with the shore bases appropriate to these aircraft, but to retain all land-based squadrons (including flying boats) under the Air Ministry, with full liberty to employ these squadrons in time of war on whatever duty is in the best interest of the nation according to the decision of the Government at the time.

"WINGS."

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REFERENCE SECTION

Comprising

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS

TABLES OF COMPARATIVE NAVAL STRENGTH

BRITISH AND FOREIGN AIRCRAFT TYPES

BRITISH AND FOREIGN ORDNANCE TABLES

MISCELLANEOUS

PROFILES OF BRITISH AND FOREIGN WARSHIPS

PLANS OF BRITISH AND FOREIGN WARSHIPS

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DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS

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LIST OF BRITISH AND FOREIGN SHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.c.	Armoured cruiser.	A.T.	Aircraft tender.
a.g.b.	Armoured gunboat.	S.C.	Seaplane carrier.
g.b.	Gunboat.	H.N.S.	Harvey nickel steel.
b.	Battleship.	H.S.	Harveyised or similar hard-faced steel.
b.c.	Battle-cruiser.	K.S.	Krupp steel.
l.cr.	Light cruiser.	*t.*	Speed and H.P. at trials (in speed and H.P. columns).
c.d.s.	Coast-defence ship.	b.p. or p.p.	Length of ship between perpendiculars.
M.Cr.	Minelaying cruiser.		
cr.	Cruiser.		
A.A. or H.A.	Anti-aircraft guns.		
A.C.	Aircraft carrier.		

L. Light guns under 15 cwt., including boats' guns.

M. Machine guns.

Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T.	Water-tube boilers, where the type is not known.	My.	Myabara.
B.	Belleville.	Nic.	Niclausse.
Bl.	Blechynden.	Pen.	Penhoet.
B. & W.	Babcock and Wilcox.	T.	Thornycroft.
D'A.	D'Allest.	T.S.	Thornycroft-Schulz.
		Y.	Yarrow.

The following abbreviations distinguish types of machinery:—

P.T.	Parsons turbines.	tur.	Turbines, where the type is not known.
C.T.	Curtis turbines.	recip.	Reciprocating engines.
B.C.T.	Brown-Curtis turbines.	I.C.	Internal combustion engines.
(G.)	Geared turbines.		

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (*i.e.* excluding fuel and reserve feed water).

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GREAT BRITAIN.—Battleships and Battle Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Normal Draught.	Horse-Power. Type of Boilers.	Where Built.	Makers of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.	in.	in.	in.	in.			knots.	
b.	King George V.	35,000					Vickers-Walker	Vickers (Barrow)	Bdg.									*14-in.* guns.			
b.	Prince of Wales	35,000					Cammell Laird	Cammell Laird	Bdg.									*14-in.* guns.			
b.	Barham . .	31,100	643¾	104 0	31 3	75,000 Y.	Clydeb'nk	J. Brown B.C.T.	1914	1915	2,470,113	13–4	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*; 5 M.; 11 L. 1 catapult, 1 aircraft	2 (sub.) 21″	25‖	112
b.c.	Hood . .	42,100	860¾	105 3	28 6	144,000	Clydeb'nk	J. Brown B.C.T. (G.)	1918	1920	5,698,946	12–6	3–1	7–5	5–4	11	(*a*)	8 *15-in.*, 12 *5·5-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.*; 5 M.; 11 L.	4 a.w. 2 (sub.) 21″	31	134
b.	Malaya¶ .	31,100	640¼	104 0	31 3	75,000 B. & W.	Walker .	Wallsend . P.T.	1915	1916	2,945,709	13–6	3-1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 1 *2 pr.*; 5 M.; 11 L.; 1 catapult, 1 aircraft.	2 (sub.) 21″	25‖	113
b.	Nelson . .	33,500	710	106 0	30 0	45,000	N'wc'stle-on-Tyne	Wallsend B.C.T. (G.)	1925	1927	6,410,071	14	6¼	..	..	16–9	..	9 *16-in.*, 12 *6-in.*, 6 *4·7-in.* A.A.; 4 *3-pr.*, 1 *2-pr.* mult. p.p., 2 *2-pr.*; 5 M.; 11 L.; 1 aircraft.	2 (sub.) 24″	23	136
b.	Queen Elizabeth	31,100	644¼	‡104 0	31 3	75,000 B. & W.	Portsm'th	Wallsend . P.T.	1913	1915	2,473,103	13–4	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L.	2 (sub.) 21″	25‖	118

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b.	**Ramillies**		620½	‡102 0			Dalmuir	Beardmore, P.T.	1916	1917	3,295,810										1010
b.	**Resolution**		620¼	‡101 4			Jarrow	Palmer P.T.	1915	1916	2,449,680										1012
b.	**Revenge**	29,150	625¾	‡101 5	29 0	40,000 Y.	Barrow	Vickers P.T.	1915	1916	2,406,368	13–4	4–1	6	6–4	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L. (Resolution 5 *4-in.* A.A.) Resolution, Royal Oak, and Ramillies have a catapult on X turret and carry 1 aircraft.	2 (sub.) 21″	23‖	1104
b.	**Royal Oak**		620½	‡102 1			Devonp'rt	Hawthorn P.T.	1914	1916	2,468,269										1149
b.	**Royal Sovereign**		620¾	‡101 6			Portsm'th	Parsons P.T.	1915	1916	2,570,504										1104
b.c.	**Renown***	32,000	794¼	102 4	25 6	112,000 B. & W.	Govan	Fairfield B.C.T.	1916	1916	3,117,204	9–3 K.C.	2	6–3	4–3	11–7 K.C.	6 K.C.	6 *15-in*, 12 *4-in.*, 4 *3-pr.*, 8 *4-in.* A.A.; 5 M.; 11 L.; catapult and 4 aircraft in Repulse	2† (sub.) 21″	31·5‖	1188
b.c.	**Repulse***			102 6			Clydeb'nk	J. Brown B.C.T.	1916	1916	2,829,087										1209
b.	**Rodney**	33,900	710	106 1	30 0	45,000	Birkenh'd	Cammell Laird B.C.T. (G.)	1925	1927	6,414,653	14	6¼	..	..	16	..	9 *16-in.*, 12 *6-in.*, 6 *4·7-in.* A.A; 4 *3-pr.*; 6 *2-pr.*; 5 M.; 11 L.	2 (sub.) 24″	23	1315
b.	**Valiant**	31,100	639¾	104 ‡ 0	31 3	75,000 B. & W.	Govan	Fairfield B.C.T.	1914	1916	2,537,037	13–6	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L., 1 catapult, 1 aircraft	2 (sub.) 21″	25‖	1136
b.	**Warspite**	31,100	644½	104 ‡ 0	31 3	75,000 Y.	Devonp'rt	Hawthorn P.T.	1913	1915	2,518,360	13–6	3–1	6	4–2	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.*, 4 *4-in.* A.A.; 5 M.; 11 L 1 catapult, 1 aircraft.	2 (sub.) 21″	25‖	1130

* Repulse reconstructed 1936. Renown now in hand for modernisation, including re-engining.
¶ Built at the charge of the Federated Malay States.
NOTE.—Three battleships are projected for 1937.

† Repulse has 8 a.w. tubes in addition.
‖ Speed without bulges.
(*a*) Guns are in shields of 1-in. H.T. plating

‡ Over rubbers.

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GREAT BRITAIN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Extreme breadth under water over rubbers.	Draught.	Horse-Power. Type of Boiler.	Where Built.	Maker of Engines. Type of Machinery.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
A.C.	Illustrious	22,000					Vickers (Barrow)	Vickers (Barrow)	Bldg								
A.C.	Victorious						Vickers (Walker)	Wallsend	Bldg.								
A.C.	Ark Royal	22,000	685 (b b.)	94 0	23 0	..	Cammell Laird	..	Bldg.	..	..	..	..	4·5-in. guns	—	..	..
A.C.	Argus	14,450	567	75 9	21 0	20,000	Dalmuir	Beardmore P.T.	1917	1918	Purchased under construction	..	..	6 4-in. A.A., 4 3-pr. 4 M., 10 L., accommodates 20 aircraft	—	20·2	420
S.C.	Pegasus * (late Ark Royal)	6,900	366	50 10	17 6	3000	Blyth	Blyth S. B. Co. recip.	1914	1914	do.	..	..	4 M., 10 L.	—	11	139
A.C.	Courageous	22,500	786¼	90 6 over rubbers	22 3	90,000 Y.	Walker † (Armstr'g)	Parsons P.T.(G.)	1916 As cruisers.	1928 As aircraft carriers.	1,785,940 (a) 2,115,944 (b)	3	9–7	16 4·7-in., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 42 L.	—	30½	770
A.C.	Glorious						Belfast †	Harland & Wolff P.T.(G.)		1930	2,119,066 (a) 2,137,374 (b)	3	9–7				
A.C.	Eagle, *ex*-Almirante Cochrane.	22,600	667½	105 2	21 11	50,000 Y.	Walker (Armstrong)	J. Brown B.C.T.	1918 As a battleship.	1924 As an aircraft carrier.	4,211,576	.	..	9 6-in., 4 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 32 smaller, 20 aircraft	—	24	753
A.C.	Furious	22,450	786½	90§ 1	21 6	90,000 Y.	Walker (Armstrong)	Wallsend Engn'g Co. B.C.T.(G.)	1916 As a cruiser.	1925 As an aircraft carrier.	2,436,603	3 —	7	10 5·5-in., 3 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 46 smaller, 30 aircraft	—	31	728
A.C.	Hermes	10,850	600	70 3	18 7	40,000	Elswick	Parsons Co. P.T.(G.)	1919	1924	2,030,263‡	..	..	6 5·5-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 4 M., 16 L., 15 aircraft	—	25	551

* Used for experimental work. † Reconstructed as aircraft carriers at Devonport dockyard. ‡ Estimated cost including guns. § Over rubbers; 120 ft. over pallisades.
(a) First cost of ship as a cruiser. (b) Estimated cost of reconstruction as an aircraft carrier.

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GREAT BRITAIN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Types of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
Dido Class	Dido Euryalus Naiad Phoebe Sirius	5,000							Bldg.								
Improved Southampton Class	Belfast	10,000					Harland & Wolffe	Harland & Wolffe	Bldg.								
	Edinburgh						Swan Hunter	Wallsend	Bldg.								
South-ampton Class	Southampton	9,000	584 on W.L.	61 8	17 0	7,500	J. Brown Vickers, (Tyne)	Scotts	1936	1937	..	..	..	12 6-in., 8 4-in. A.A., 2 smaller, 1 catapult, 3 aircraft	6	32	..
	Newcastle						Scotts Vickers, Tyne		Bldg.								
	Glasgow						Devonp'rt										
	Sheffield						Fairplay										
	Birmingham						H'wthorn										
	Liverpool						Devonp'rt										
	Manchester																
	Gloucester																
Arethusa Class	Galatea	5,200	506	51 0	13 10	64,000	(Scott) Greenock	Scott	1934	1935	..	..	..	6 6-in. guns, 4 4-in. A.A., 18 smaller, 1 catapult, 1 aircraft	2 T. 21″	32¼	..
	Arethusa						Chatham	Parsons									
	Penelope						Harland & Wolff	Harland & Wolff	1934	1935							
	Aurora						Portsm'th	Wallsend	1935	1937				4 4-in. twin mounting in Aurora			

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GREAT BRITAIN.—Cruisers—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
Leander Class	Ajax	7,000	554½ o.a., 522 b.p.	55 8	16 0	72,000 P.T. (G.)	Barrow	Vickers	Bldg.	1935	..	..	..	8 6-in., 4 4-in. A.A., 4 3-pdr. guns, 5 M.G., 12 smaller, 1 floatplane	2 Q. 21″	32½	570
	Achilles	7,030					Birkenhead	Cammell Laird	1932	1933							
	Neptune	7,000					Portsm'th	Parsons	1933	1934	1,560,414	..	..				
	Orion	7,070					Devonport	Vickers-Armstrongs	1932	1934	1,548,663	..	..				
	Leander	7,140	..	55 2	..	..	Devonp'rt	Vickers-Armstrongs	1931	1933	1,667,819	..	.				
Modified Leander Class	Amphion	7,000	560	56 8	15 8	72,000	Portsm'th	Beardmore	1934	1936	..	..		8 6-in., 4 4-in., 21 smaller, 1 catapult, 2 aircraft	..	32½	..
	Apollo						Devonport	Beardmore	1934	1936							
M.Cr.	Adventure	6,800	539	59 0	14 5	40,000 tur. and Diesel	Devonp'rt	Vickers	1924	1927	1,246,083	..	..	4 4·7-in. A.A., 4 3-pr., 4 2-pr. Pom Poms; 2 M., 8 L. 310 mines	—	27¾	395
Kent Class	Berwick	9,750	630	68 4	16 3	80,000 (G.) Y.	Govan	Fairfield	1926	1928	2,029,526	..	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 8 L., 1 aircraft	2 Q. 21″	31½	700
	Cornwall						Devonp'rt	Beardmore	1926	1928	1,252,110*	..	..				
	Cumberland						Barrow	Vickers	1926	1928	2,960,821*	..	..				
Carlisle Class.	Cairo	4200	451¾	43 10	14 1	40,000 (G.) Y.	Birkenhead	Cammell Laird	1918	1919	787,479	3 —	..	5 6-in., 2 3-in A.A., 4 3-pr. 2 2-pr. Pom Poms, 2 M., 8 L.	8 a.w. 21″ (D.)	29	415
	Calcutta						Barrow	Vickers	1918	1919	832,123						
	Capetown						Birkenhead	Cammell Laird	1919	1922	1,984,720						
	Carlisle						Govan	Fairfield	1918	1918	669,216						
	Colombo						Govan	Fairfield	1918	1919	692,308						

* Total estimated cost of ship, including guns.

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Caledon Class	Caledon	4180	450 –450¼	43	1	14	1	40,000 P.T. (G.) Y.	Birkenhead	Cammell Laird	1916	1917	547,300	3	..	5 *6-in.*, 2 *3-in.* A.A., 2 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.	8 a.w. 21″ (D.)	29	420
	Calypso								Newcastle (Hawth'n)	Hawthorn Leslie	1917		529,190						
	Caradoc								Green'ck	Scotts'	1916		534,583						
Ceres Class	Cardiff	4290	450 –450⅓	43	9	14	1	40,000 (G.) Y.	Govan	Fairfield	1917	1917	542,507	3	..	5 *6-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms; 2 M., 8 L.	8 a.w. 21″ (D.)	29	430
	Ceres								Clydebank	J. Brown	1917	1917	529,248						
	Curacoa								Pembroke	Harland & Wolff	1917	1918	794,201						
	Curlew	4290	450	43	9	14	1	40,000 (G.) Y.	Barrow	Vickers	1917	1917	544,436	3	..	10 4-*in.* A.A., 2 *3-pr.*, 2 multi M.G., 2 M.G., 8 Lewis	..	29	430
	Coventry								Swan Hunter	Swan Hunter	1917	1918	586,182						
D Class	Despatch	4850	471¼ –472¾	46 –46	3 9	14	3	40,000 (G.) Y.	Govan	Fairfield	1919	1922	1,016,870	3	Shields	6 *6-in.*, 3 *4-in.* A.A., 2 M., 4 *3-pr.*, 8 L., 2 *2-pr.* Pom Poms.	12 a.w. 21″ (T.)	29	460
	Danaë								Elswick	Armstrong	1918	1918	701,600						
	Dauntless								Jarrow	Palmer	1918	1918	750,025						
	Dragon								Green'ck	Scotts'	1917	1918	690,083						
	Delhi								Elswick	Armstrong	1918	1919	785,145						
	Durban								Green'ck	Scott	1919	1921	954,667						
London Class	Devonshire	9750	630	66	0	17	0	80,000 P.T. (G.) Y.	Devonp'rt	Vickers	1927	1929	2,007,275	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft.	8 a.w. 21″ (Q.)	32¼	700
Norfolk Class	Dorsetshire	9900	633	66	0	17	0	80,000 (G.)	Portsmouth	Cammell Laird	1929	1930	2,101,951	..	..	8 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 6 M., 8 L., 1 aircraft.	8 21″ (Q.)	32¼	710

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GREAT BRITAIN.—Cruisers, &c.—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. ins.	ft. ins.						£	in.	in.			knots.	
Improved Birmingham Class	Effingham ‡	9770	605	65 2	17 3	65,000 (G.) Y.	Portsmouth	Harland & Wolff	1921	1925	2,138,999	3 / —	Shields	7 7·5-in., 3 4-in. A.A., 4 3-pr., 2 2-pr., 2 M., 8 L.	4 a.w. 1 sub.	30½	713
	Frobisher ‡	9860		65 1			Devonport	Wallsend Eng. Co.	1920	1924	2,035,915†			6 7·5-in., 2 4-in. A.A., 4 3.-pr., 2 M., 8 L.	2 sub.	30½	715
E Class	Enterprise	7580	570	54 9	16 6	80,000 B.C. (G.) Y.	Clydebank	John Brown	1919	1926	1,690,658*	3–1½ / 1	..	7 6-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 8 L., 1 aircraft.	16 21" (Q.)	33	577
	Emerald	7550		54 7			Elswick	Armstrong	1920	1926	1,617,120						
York Class	Exeter	8390	575	58 0	17 0	80,000 (G.) Y.	Devonp'rt	Parsons	1929	1931	1,837,415*	..	..	6 8-in., 4 4-in. A.A., 4 3-pr., 6 M., 8 L., 2 aircraft.	6 21"	32	630
Improved Birmingham Class	Hawkins ‡	9800	605	65 1	17 3	55,000 (G.) Y.	Chatham	Parsons Co.	1917	1919	1,599,741	3 / —	Shields	7 7·5-in., 4 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 2 M., 8 L.	4 a.w. 2 sub.	29½	747
Kent Class	Kent	9850	630	68 5	16 8	80,000 (G.) Y.	Chatham	Hawthorn Leslie	1926	1928	2,084,213†	..	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms; 4 M., 8 L., 1 aircraft.	8 21" (Q.)	31½	685
London Class	London	9750	630	66 0	17 0	80,000 P.T. (G.)	Portsmouth	Fairfield	1927	1929	2,029,949*	..	..			32¼	685
Norfolk Class	Norfolk	9850	633	66 0	17 0	80,000 (G.)	Fairfield	Fairfield	1928	1930	2,141,961*	..	..	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 8 L., 1 aircraft.	8 21" (Q.)	32¼	685
London Class	Shropshire	9730	633	66 0	17 0	80,000 (G.)	Dalmuir	Beardmore	1928	1929	1,941,950†	..	..		8 21" a.w. (Q.)		
	Sussex	9730	633	66 0	17 0	80,000 (G.)	Hawthorn Leslie	Hawthorn Leslie	1928	1929	1,975,800†	..	..				

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Kent Class.	Suffolk . .	9800	630	68	5	16	3	80,000 (G.)	Portsmouth	Parsons .	1926	1928	2,180,240†	..	..	8 *8-in.*, 6 *4-in.* A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L, 4 aircraft	8 21″ a.w. (Q.)	31½	685
Improved Birmingham Class . .	Vindictive ‡ .	9996	605	65	2	17	3	60,000 (G.) Y.	Belfast	Harland & Wolff .	1918	1918	1,671,712	3	Shields	6 *7·5-in.*, 3 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 2 M., 8 L.	4 a.w. 2 sub. 21″	30	720
York Class.	York . .	8250	575	57	0	17	0	80,000 P.T. (G.) Y.	Palmers'	Palmers' .	1928	1930	1,774,276	..	..	6 *8-in.*, 4 *4-in.* A.A., 4 *3-pr.*, 2 *2-pr.* Pom Poms, 4 M., 8 L., 1 aircraft	6 21″ (T.)	32¼	623

* Total estimated cost of ship, including guns.
‡ Effingham, Frobisher and Hawkins are being re-armed with 6-in. guns.
† Estimated cost, excluding armament and ordnance stores.
Vindictive is being de-militarised and will be employed as a training ship.

Patrol Boats.—P.C. 74, 610 tons, 20 knots, 1 4-in.; Dart (1918), 610 tons, 20 knots, 1 4-in., 2 12-pr.; P.59 (1917), P.40 (1916), Spey (1917), 560 tons, 20 knots, 1 4-in., 1 2-pr.

Training Ships and Gunnery Drill Ships (ex-Monitors).—Erebus, 7,200 tons; Terror, 7,200 tons; Marshal Soult, 6,400 tons.

Fishery Protection Gunboats (ex-trawlers).—Colne, Doon, Dee, Eden, Foyle, Garry, Kennet, Liffey, 490–550 tons, 11 knots, reciprocating machinery, 1 12-pr.

Destroyer Depôt Ships.—Greenwich (1916), 8,100 tons; Sandhurst (converted 1916), 11,500 tons; Woolwich (1935), 8750 tons, 15 knots, 4 4-in. A.A.

Submarine Depôt Ships.—Lucia, 5,800 tons; Titania, 5,250 tons; Alecto, 935 tons; Dolphin, 4530 tons; Cyclops, 11,300 tons; Medway (Vickers', 1929), displacement 14,650 tons, speed 15 knots, armament 2 4-in., 4 4-in. A.A. Maidstone, building.

Repair Ships.—Resource (Vickers', 1930), displacement 12,300 tons, speed 15 knots, armament 4 4-in. A.A.

Minelayers (ex-Monitors), 1915.—Medea, 540 tons, 12 knots, 44 mines; Medusa, Melpomene, Minerva, 355 tons, 10 knots, 52 mines; (ex-trawlers) Vernon, 430 tons; Kate Lewis, 308 tons, 24 mines.

Surveying Vessels.—Beaufort, Fitzroy, Flinders, and Kellett, 800 tons, 16 knots, 1 3-pr.; Herald, Ormonde, and Iroquois, 1,650 tons, 15½ knots, 1 3-pr.; Endeavour, 1280 tons, 13 knots, 1 3-pr.; Challenger (Chatham, 1931—originally intended as a fishery investigation vessel), 11,40 tons, 1,200 H.P. (recip.), 12½ knots. See also under Sloops.

Non-magnetic Survey Vessel.—Research, building by Phillips at Dartmouth.

Netlayer and Target Towing Vessel.—Guardian (Chatham, 1931–3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A. Protector (1934 programme), 2900 tons, building at Messrs. Yarrow.

Mining School (Vernon) Tender.—Nightingale (Portsmouth, 1931), Skylark (Portsmouth, 1932), displacement 275 tons, horse-power 400, speed 10 knots, coal capacity 15 tons.

Boom Defence Vessels.—Moorgate (Bow, McLachlan 1931), 345 tons, 1 4-in. gun; Bishopsgate (Henry Robb, 1932) and Aldgate (1934); Watergate (1934), 290 tons; Ludgate, Dowgate, Dunnet.

Tenders.—(For Submarine depot, Portland), Elfin (1933), 222 tons, 250 H.P., 9½ knots. (For Torpedo School) Redwing (1933), 225 tons, 250 H.P., 9½ knots.

Gunnery Training Ship.—Battleship Iron Duke has been de-militarised under the London Treaty and converted to a Gunnery Training Ship (1931–32).

Fleet Target Ship.—Centurion (ex-battleship), 25,500 tons.

Trawlers.—Basset (1935), 480 tons, 1 4-in. gun; James Ludford, Blackwater and Kennett (War built); Lilac, Laurel, Holly, Hawthorn, Cedar, Cypress, Sycamore, Syringa, Magnolia, Willow, Tourquaze, Topaze, Sapphire, Tourmaline, Jasper, Cornelian, Pearl, Ruby, Amethyst and Agate, purchased in 1935, 1 4-in. gun.

Special Service Vessels.—Plover and Linnet—tenders to Vernon; and Lassoo a tender to Osprey, building.

Motor Torpedo Boats.—Six constructed by the British Power Boat Co., 1936.

Training Ship.—The liner Majestic was purchased 1936, and is being converted to a training ship and will be renamed Caledonia.

Auxiliaries.—Tugs, Drifters, Hospital Ship (Maine, 10,100 tons), Oilers, Store ships, etc,

For sloops, minesweepers and river gunboats, see Flotilla tables, pp. 254–266.

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Defence Forces of the Dominions.

ROYAL AUSTRALIAN NAVY.

Under Control of the Australian Naval Board.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Complement (War).
		tons.	ft.	ft. in.	ft. in.						£	in.	in.			knots	
Kent Class Cruisers	Australia	9870	630	68 4	16 3	80,000 B.C. (G.) Y.	Brown	Brown	1927	1928	..	..	..	8 *8-in.*, 4 *4-in.* A A., 4 *3-pr.*, 4 *2-pr.* Pom Pom, 4 M., 12 L.	8 21″ a.w. (Q.)	31½	685
	Canberra	9850					Clydebank										
Amphion Class	Sydney	7000	530 b.p.	56 8	15 8		Wallsend	Wallsend	1934	1935				8 *6-in.*, 4 *4-in.* A A., 21 smaller, 1 catapult, 1 aircraft	2 Q. 21″	32½	
Adelaide Type Cruiser	*Adelaide	5100	462½	50 1	15 10	25,000 P.T. Y.	Sydney	Sydney	1918	1922	..	3 / —	..	9 *6-in.*, 1 *3-in.* A.A., 4 *3-pr.*, 10 L., 2 M.	2 (sub.) 21″	25·5	450
Seaplane Carrier	*Albatross	4800	443¾	61 0	15 6	12,000 P.T. (G.)	Cockatoo Island	Sydney	1928	1929	—	—	—	4 *4·7-in.* A.A., 4 *2-pr.* Pom Pom, 4 *3-pr.* 4 M., 20 L., 9 seaplanes	—	21	350
Flotilla Leader	Stuart	1530	332½	31 9	12 3	40,000	Hebburn	Hawthorn Leslie	1918	1918	—	—	—	5 *4·7-in.*, 1 *3-in.* A.A., 7 M. & L.	6†	36½	182

DESTROYERS.—"*V*" *Class*:—Vampire, Vendetta, Voyager, Waterhen. Completed, 1917–18; Displacement, 1,090 tons; 27,000 H.P.; speed, 34 knots; armament, four 4-in.; 6 smaller guns, 6 torpedo tubes.

"*S*" *Class*:—Stalwart, Success, Swordsman, Tasmania, Tattoo. Completed, 1919; Displacement, 905 tons; 27,000 H.P.; speed, 36 knots; armament, three 4-in., one 2-pdr., 2 double 21″ torpedo tubes.

SLOOPS.—Yarra (1935), 1060 tons, 2000 H.P. (T.G.), 16½ knots, 3 4-in., 13 smaller guns, and Swan, a repeat vessel, building.

SURVEYING VESSEL: Moresby (late Silvio) (1918), 1650 tons, length 267½ ft., 2,500 H.P., 15 knots, one 3-pr.

DEPÔT AND FLEET REPAIR SHIP: Penguin (late Platypus) (J. Brown, Clydebank, 1917). Displacement 3,455 tons, 14 knots, 1 4-in.

* Paid off into Reserve. † Torpedo tubes are removed from "Stuart."

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NEW ZEALAND NAVY.

Under the control of New Zealand Naval Board.

LIGHT CRUISERS—"*D*" *Class*:—Dunedin; completed, 1919 (Elswick). Diomede; completed 1922 (Vickers). Displacement, 4,850 tons; 40,000 H.P.; speed, 29 knots; armament, 6 6-in., 3 4-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 4 triple 21-in torpedo tubes; max. fuel, 1,060 tons oil; complement, 450.

TRAINING AND DEPOT SHIP.—Philomel (2570 tons); 1 6-in., 1 4-in., 2 12-pr. TRAWLER.—Wakakura.

The CRUISER Achilles and the SLOOPS Leith and Wellington are allocated to the station.

ROYAL CANADIAN NAVY.

Under control of the Canadian Department of National Defence.

DESTROYERS.—Crescent and Cygnet taken over by Canada 1936. Built by Vickers 1932; 1375 tons: 36,000 H.P.; 35½ knots; armament, 4 4·7 in., 1 3-in. A.A., 2 12-pr., 1 M.G., 4 smaller guns, 2 Quadruple 21" torpedo tubes; Champlain (ex-Torbay) and Vancouver (ex-Toreador). Completed, 1919 (Thornycroft). Displacement, 905 tons; 29,000 H.P.; speed, 36 knots; armament, 3 4-in., 1 2-pr., 2 double 21-in. torpedo tubes; oil, 305 tons (radius of action, 3,500 at 15 knots). Saguenay and Skeena completed at Thornycroft's in 1931: displacement, 1337 tons; 32,000 H.P.; speed, 35 knots; armament, 4 4·7-in., 2 2-pr., 2 quad. 21-in. torpedo tubes; oil, 440 tons.

DEPOT SHIPS.—Naden and Stadacona. MINESWEEPING TRAWLERS.—Festubert, Ypres, and Armentieres (1918), 360 tons.

SOUTH AFRICA.

[The seagoing force of the South African Naval Service was disbanded in 1934.]

ROYAL INDIAN NAVY.

MINESWEEPING SLOOPS.—Indus (1935, Hawthorn Leslie), 1,190 tons; 2,000 H.P.; 16¼ knots; 2 4.7-in., 15 smaller guns. Hindustan (1930, Swan Hunter), 1,190 tons; 2,000 H.P.; 16¼ knots; 2 4-in., 14 smaller guns. Clive, 2,021 tons; 1,700 H.P.; 14½ knots; 2 4-in., 2 2-pdr., 4 3-pdr. guns; completed Beardmore, 1920. Lawrence, 1,259 tons; 1,900 H.P.; 15 knots; 2 4-in., 4 3-pdr., 2 2-pdr. guns; launched Beardmore, 1919.

SLOOPS.—Cornwallis, 1,350 tons; 16½ knots; 2,500 H.P.; 3 4-in., 2 2-pdr., 4 3-pdr. guns (launched Hamilton, 1917, as the Lychnis).

SURVEYING SHIPS.—Investigator (Vickers, 1907), 1,172 tons; 1,550 H.P.; 13 knots; no guns.

PATROL BOATS.—Pathan (ex-P.C. 69), 695 tons; 3,500 H.P., 20 knots, and 1 4-in. and 2 12-pdr. guns; completed 1918.

DEPOT SHIP.—Dalhousie (1886), 1960 tons; 4 3-pdr. guns.

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ARGENTINE REPUBLIC.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.	To replace Presidente Sarmiento	7000	535	56	16	55,000	Vickers, Barrow	Bldg.	1937 (c)	..		..	..	..	.	..	9 *6-in.*, 4 *4-in.* A.A., 25 A.A. M.G., 1 catapult, 2 aircraft.	6 21″ (T.)	30	—	600
c. c.	Almirante Brown Vinticinco de Mayo	6495	545¾	58	16¼	85,000 Y. (G.)	Leghorn Genoa	1929	1931	1,250,000	..	1″	..	..	..	..	6 *7·5-in.*, 12 *4-in.* A.A., 6 Pom Poms, 1 catapult, 2 seaplanes.	6 21″ (T.)	32	— 1660	600
c.d.s.	General Belgrano†	6100	328	59¾	24	13,000	Leghorn	1897	1899	696,700	6–3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 10 *6-in.*, 6 *4·7-in.*, 4 *6-pr.*	—	20	oil	515
c.d.s.	General San Martin†	6100	328	59¾	24	13,000	Leghorn	1896	1898	688,200	6–3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	6 H.S.	4 *8-in.*, 6 *4·7-in.*	—	20	oil	431
c.d.s.	Pueyrredon †	6100	328	59¾	24	13,000	Sestri Ponente	1898	1901	782,000	6–3 H.S.	1½	6 H.S.	5 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 8 *6-in.*, 4 *6-pr.*, 1 *1-pr.* A.A.	—	20	oil	430
b.	Moreno Rivadavia	27,720	585	97¾	28	45,000* (G.)	Camden, N.J. (N.Y.S.B.Co.) Quincy, Mass.	1911	1915 1914	2,200,000	12–10 K.S.	3–2	9–6 K.S.	9 K.S.	12–9 K.S.	6 K.S.	12 *12-in.*, 12 *6-in.*, 4 *3-pr.*, 6 M., 4 L.	2 (sub.) 21″	22·5	— 4200	1200 940

The old coast-defence ironclads Libertad and Independencia, 2595 tons, completed at Birkenhead in 1891–93, and converted to oil fuel in 1927, carry two 9·4-in., four 4·7-in., and four 3-pr. guns. The Libertad is used as parent ship for submarines.

River gunboats Paraná and Rosario (Elswick, 1908), 1055 tons, two 6-in. howitzers, six 3-in., 2 L., 15 knots.

The training-ship (cruiser) (Birkenhead, 1896; refitted 1926), Presidente Sarmiento, 2320 tons, 15 knots; four 4·7-in., four 6-pr., two 3-pr.

Sloops (surveying vessels), San Juan and San Luis (Hawthorn Leslie, Newcastle, 1928), 790 tons, 1—3-in 12 knots. Alferez Mackinlay (1914), 783 tons, 10 knots.

Tugs, Mataco, Toba (completed 1928, at Messrs. Hawthorn Leslie's, Newcastle), Azapardo (1919), Ona, Querandi (Thornycroft, 1914), and 12 others.

Nine Minesweepers (ex-German), seven transport and other auxiliaries. 4 Minesweepers building at Santiago; 500 tons; 2000 H.P.; 16 knots; 2 4-in. A.A. guns.

One cruiser, three sloops, two transports and four coastguard vessels are projected.

* Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928.

† Converted to oil burning and armament altered in 1929. Used as training ships.

Seven despatch vessels of 550 tons are building in Argentine shipyards, and will be named Bouchard, Drummond, Granville Parker, Robinson, Seaver, and Spiro.

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BRAZIL.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkheads.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.d.s.	Floriano	3162	267½ p.p.	48	13¼	3400	La Seyne	1897	1901	..	13¾–4 H.S.	1½	..	..	8 H.S.	3 H.S.	2 9·4-in., 4 4·7-in., 2 M., 4 6-pr.; 2 L.	—	15·0	246 / —	260
b.	Minas Geraes *	19,200	541	83	25	25,000 t B.&W.	Elswick	1909	1910	1,821,400	9–6–4 K.S.	2	9–6–4 K.S.	9	12–8 K.S.	9 K.S.	12 12-in., 16 4·7 in., 4 3-in. A.A.; 4 A.A. M.G.	—	21	2360	850
b.	São Paulo						Barrow	1908	1910								12 12-in., 12 4·7-in., 6 3-pr., 2 3-in. A.A.; 4 M.			350	
cr.	†Bahia	3100	401½	39	13½	22,000 B.C.T. (G.) Th.	Elswick	1909	1910	..	..	..	..	..	..	..	10 4·7-in., 4 3-pr.	4 21″ (D)	27	Oil	450
cr.	†Rio Grande do Sul																				

* Fitted with new oil-burning water-tube boilers by Thornycrofts, 1935. † Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

River Gunboats.—Missões (1904), 200 tons, 11 knots, one 15 pr., one 6 pr.; Oyapock, 195 tons, 14 knots, one 3 pr.
Gunboats.—Almirante Bastos dos Reis and Almirante Brasil; ordered in 1931.
Minelayers.—Maria do Couto, Carneiro da Cunha, Heitor Perdigao and Muniz Freire.
River Monitor.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro (1910).
Gunboat Scout.—Victoria (ex-Espirito Santo), 470 tons, two 4·7-in., two 3-pr., 11 knots.
Submarine Tender.—Ceará (Spezia, 1916), 4000 tons, 4100 H.P., 14 knots, four 4-in. guns.
Armed Transport.—Belmont (ex-German SS. Valesia), 5227 tons gross, four 4·7-in, six 6-pr.
Training Ship.—Saldanha Dagama, Vickers' (1934). A four-masted schooner, 3325 tons, 262 feet in length, four 4-in. and one 3-in. A.A. guns.

The approved building programme includes two cruisers of 8,500 tons, to be completed in 8 years. Orders have not yet been placed.

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CHILE.—Armoured Ships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**Almirante Latorre** * (ex-H.M.S. Canada)	28,950	661	92 6	29 0	37,000 P.T.Y.	Elswick	1913	1915	..	9–4	4–2½	4½	..	10	6	10 *14-in.*, 14 *6-in.*, 4 *4-in.*, A.A., 2 *3-in.*, A.A., 4 *3-pr.*, 1 catapult.	4 (sub.) 21″	23	Oil.	1000
a.c.	**General O'Higgins**	6,977	412 p.p.	62 9	22 0	16,000 B.	Elswick	1897	1898	..	7–5	2	..	..	7½–6	6	4 *8-in.*, 10 *6-in.*, 12 *3-in.*, 4 M.	—	21·5 *t*	1200 / —	500
b.	**Capitan Prat** †	5,416	328 p.p.	60 9	22 9	12,000	La Seyne	1890	1893	391,000	12	3	4	..	10½	2	4 *9·4-in.* (Canet), 8 *4·7-in.* (Canet), 8 *6-pr.*, 11 M.	2 18″	18	775 / —	500

* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931). † Submarine parent ship.

Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Coal.	Complement.
		tons.	ft.	ft. ins.	ft. ins.						in.	in.			knots.	tons.	
cr.	**Blanco Encalada**	3435	370 p.p.	46 6	19 6	14,500	Elswick	1893	1894	..	4–1¾	..	2 *8-in.*, 10 *6-in.*, 4 *3-in.*	—	22·78 *t*	850 / —	385
,,	**Chacabuco**	3417	360 p.p.	46 6	17 0	15,500	Elswick	1901	1903	..	4½–1¾	..	2 *6-in.*, 10 *4·7-in.*, 4 *3-in.*	—	24·0	1000 / —	400

OILERS (Armstrongs, 1930): Maipo, 4,686 tons gross; Rancagua, 3,080 tons displacement, two 4·7-in. guns. COASTGUARD VESSELS: Orompello, Leucoton, Elicura, 530 tons; built 1919; 14 knots; 2 3-in. guns; Aguila, 820 tons; Porvenir .450 tons. Sibald, Yelcho, Micalvi, Condor, and Yanez. SUBMARINE DEPOT SHIP: Araucano (Vickers-Armstrongs, Barrow), completed 1930; displacement 5,890 tons; armament two 4·7-in.; length b.p. 390 ft.: beam 55 ft.; draught 16 ft. 6 ins.; speed 13 knots; H.P. 2,500; 1 seaplane.

TRAINING SHIP.—General Baquedano (1898), 2350 tons, four 4-in. guns, two 3-pr. Two tugs. Two towing launches.

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DENMARK.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
a.c.	**Niels Juel**	3400	295 4	53 6	15 9	5500	Copenhagen	1918	1923	..	8–4 K.S.	2	..	..	..	2 K.S.	10 *5·9-in.*, 2 *6-pr.*, 8 M.G., 10 *20*-m.m. A.A.	2 (sub.) 18″	17·0	240 / 250	309
c.d.s.	**Olfert Fischer** †	3415	283 9	50 6	16 9	4600 *t*	Copenhagen	1903	1905	..	7–4	3	..	..	7	6	2 *9·4-in.*, 4 *5·9-in.*, 6 *3-in.*, 2 *6-pr.* A.A., 2 *1-pr.*, 2 M.	3 (sub.) 18″	16·0	250 / —	256
c.d.s.	**Peder Skram**	3515	286 7	51 6	16 3	5400	Copenhagen	1908	1909	..	8–4 K.S.	2	..	..	7 K.S.	6 K.S.	2 *9·4-in.*, 4 *5·9-in.*, 8 *3-in.*, 2 *1-pr.*, 2 *3-in.* A.A., 2 M.	4 (sub.) 18″	16·0	250 / —	262

† Removed from the active list in 1936. To be used as a target ship.

Mine-layers: Lossen (1910), 600 tons, 12 knots, 2 3-in., 2 A.A. guns, 175 mines; Minekran V and VI, 186 tons, 8 knots, 60 mines; Mining boats 1–10. Groensund, torpedo boat repair ship (Diesel-electric drive); Hekla, submarine depôt ship. Submarine depôt and repair ship Henrik Gerner completed 1928, displacement 490 tons, 2450 H.P., 13 knots, carries two 3-in. guns. Fishery protection vessels: Aegir, Odin, Thor (Iceland Government), Hvidjörnen, Diana, Fenris, Island Falk, Fylla (ex-British sloop Asphodel), Beskytteren, Maagen; Ingolf (1934, to replace Fylla) 3000 H.P., two 4·7 in. and two 6-pdr. guns, one seaplane.

Surveying vessel Marstrand, built 1861, refitted 1922–1923, 158 tons, 11 knots, carries 2 M.G.

Six minesweepers (ex-Torpedo boats *), 96 tons. Five patrol vessels (ex-Torpedo boats *), 96 tons.

* See Flotilla Tables.

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FRANCE.—Battleships and Armoured Cruisers.

Class	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Richelieu	35,000	794 0 W.L.	108 6	26 7	..	Brest	Bldg.	..	..	..	..	..	..	..	..	8 *15-in.*, 16 *5·2-in.*, 8 *1·5-in.* A.A., 2 catapults, 4 aircraft.	..	..	..	..
b.	Jean Bart	35,000	794 0 W.L.	108 6	26 7	..	St. Nazaire	Bldg.	..	..	..	..	..	..	..	..		..	..	..	..
b.c.	Strasbourg	26,500	706 0	102 0	25 0	160,000	St. Nazaire	1936	Bldg.	..	..	..	..	..	..	..	8 *13-in.*, 16 *5·2-in.*, 40 *smaller*, 2 catapults, 4 aircraft.	..	32	..	..
b.	Dunkerque	26,500	706 0	101 8	27 11	100,000 -120,000	Brest	1935	Bldg.	5,200,000	10–8	4–9	..	..	..	..	8 *13-in.*, 16 *5·2 in.*, 40 *smaller*, 2 catapults 2 aircraft.	..	abt. 29	..	..
b.	Bretagne	22,189	544 6	88 6	29 0	29,000 Nic. P.T.	Brest	1913	1915	2,589,439	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 18 *5·5-in.*, 8 *3-in.* A.A., 5 *3-pr.*, 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2700 / 300	1167
b.	Condorcet	17,597	480 11	84 7	27 0	22,500 Nic. P.T.	St. Nazaire	1909	1911	2,165,200	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾ K.S.	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 4 *3-pr.*, 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2100 / —	890
b.	Courbet	22,189	544 6	88 6	29 0	28,000 Nic. P.T.	Lorient	1911	1913	2,508,388	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·5-in.*, 2 *3-pr.*, 4 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2600 / 250	1140
b.	Diderot	17,597	480 11	84 7	27 0	22,500 Nic. P.T.	St. Nazaire	1909	1911	2,167,000	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 2 *3-pr.* A.A., 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2000 / —	890
a.c.	Ernest Renan	12,234	521 7	70 0	27 6	37,600 Nic. Recip.	St. Nazaire	1906	1909	1,410,000	6¾–4 H.S.	2	5–3 H.S.	4¾	6 H.S.	5 H.S.	4 *7·6-in.*, 12 *6·5-in.*, 2 *3-in.* A.A., 4 *3-in.*, 8 *9-pr.* A.A., 2 *1-pr.*	2 (sub.) 18″	24·4 *t*	1870 / —	874
b.	Océan, *ex* Jean Bart	22,189	544 6	88 6	29 0	28,000 B. P.T.	Brest	1911	1913	2,528,888	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·5-in.*, 4 *3-pr.*, 4 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2360 / 300	1140
a.c.	Jules Michelet	11,072	489 0	70 3	27 0	30,000 Guyot Recip.	Lorient	1905	1908	1,204,107	6–4 K.S.	2	5–3 K.S.	6 H.S.	8 K.S.	5 K.S.	4 *7·6-in.*, 12 *6·5-in.*, 2 *3-in.* A.A., 10 *3-pr.*, 2 M.	2 (sub.) 18″	22·8	1870 / —	724

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b.	Lorraine * .	22,189	544	6	88	6	29	0	29,000 B. P.T.	St. Nazaire	1913	1916	2,642,439	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	8 *13·4-in.*, 14 *5·5-in.*, 8 *3·9-in.* A.A., 5 *47mm.* A.A., 2 *1-pr.*, 2 L.	4 (sub. 18″	23·0	2700/300	1167
b.	Paris .	22,189	544	6	88	6	29	0	28,000 N. P.T.	La Seyne .	1912	1914	2,603,920	11–7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	12 *12-in.*, 22 *5·5-in.*, 4 *3-pr.*, 7 *3-in.* A.A., 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2450/250	1140
b.	Provence .	22,189	544	6	88	6	29	0	29,000 P.T.	Lorient .	1913	1915	2,589,000	11 7 K.S.	2¾–1¾	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	10 *13·4-in.*, 18 *5·5-in.*, 4 *3-in.* A.A., 4 *3 pr.*, 2 *1-pr.*, 2 L.	4 (sub.) 18″	20·0	2700/300	1167
b.	Voltaire .	17,597	480	11	84	7	27	0	22,500 B. P.T.	La Seyne .	1909	1911	2,169,200	10–8 K.S.	2¾	8¾	..	12 K.S.	8¾ K.S.	4 *12-in.*, 12 *9·4-in.*, 12 *3-in.*, 2 *3-in.* A.A., 2 *3-pr.*, 2 *1-pr.*, 2 L.	2 (sub.) 18″	19·25	2000/—	890
a.c.	Waldeck-Rousseau .	12,617	521	4	70	7	27	6	35,286 Nic. *t.* recip.	Lorient .	1908	1910	1,301,380	6½–3½	2½	5	4¾	6	5½	14 *7·6-in.*, 10 *3-in.*, 10 *9-pr.* A.A., 2 *3-pr.*, 2 M.	2 (sub.) 18″	23·0 *t*	1900/—	874

* As modernised 1935.

All the above battleships were reconstructed and modernised between 1923 and 1930. The new building programme includes 2 additional 35,000-ton battleships. Since 1930 all except Diderot, Condorcet and Voltaire have been taken in hand for conversion to oil-fuel burning.

Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.			knots.	tons.	
A.C. .	Bearn * . . .	22,146	597 1	89 0	29 10	37,000	Chantiers de la Mediterranée. La Seyne	1920	1928	..	3¼	..	8 *6·1-in.*, 6 *3-in.* A.A., 8 *1-pr.* A.A., 12 M. A.A., 41 planes	4 21·7″	21·5	—/2070	875
Aircraft Transport	Commandant Teste	10,000	548 0	88 7	23 6	21,000 †	Chantiers de la Gironde, Bordeaux	1929	1932	..	2/1½	..	12 *3·9-in.* A.A., 8 *3-pr.* A.A., 12 M., 19 planes, 4 catapults, 5 cranes.	—	20·5	oil	648

* Originally designed and laid down as a battleship; to be reconditioned.
It is understood that two aircraft carriers are to be laid down during 1937.

† Schneider-Zoelly turbines (G.). Yarrow-Loire S.T. boilers.

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FRANCE.—Cruisers.

(See pages 216–7 for the armoured cruisers Ernest Renan, Jules Michelet and Waldeck-Rousseau.)

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.					£	in.	in.			knots.	tons.	
Training cruiser	Jeanne d'Arc	6496	557 8	58 0	18 8	32,000	Penhoet Yard, St. Nazaire	1930	1931	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 2 *1·6-in.*, 2 M., 2 seaplanes	2 21·7″	26	..	506
1931–32 *pr.*	Jean-de-Vienne La Galissonnière	7600	590 0	57 5	16 5	84,000	Lorient Brest	1933	1936 1935	..	..	..	9 *6-in.*, 8 *3·5-in.* A.A., 8 *1-pr.*	4 21″	31	..	..
1932–33 *pr.*	Marseillaise Gloire Montcalm Georges Leygues	7600	590 0	57 8	17 5	88,000	Ch. de la Loire, St. Nazaire Bordeaux La Seyne Penhoet Yard, St. Nazaire	1935 1935 1935 1935	1937	..	4¾	Deck 1½	9 *6-in.*, 8 *3·5-in.* A.A., 4 seaplanes	4 21″	32½	— / 1500	630
—	Algérie	10,000	610 3	64 8	20 0	84,000 (G.) Pen.	Brest	1932	1934	1,920,000	about 4	..	8 *8-in.*, 12 *3·9-in.* A.A., 8 *1-pr.*, 16 M., 2 catapults, 2 seaplanes	2 triple 21″	31	oil	746
Suffren Class	Dupleix Foch Colbert	10,000	636 6	63 0	20 7	90,000 (G.)	Brest	1930 1929 1928	1932 1931 1931	1,570,000 1,450,000 1,270,000	..	..	8 *8-in.*, 8 *3·5-in.* A.A., 6 *1-pr.* A.A., 12 M., 3 seaplanes, 2 catapults.	2 triple 21″	32	oil	605
	Suffren	10,000	607 0 b.p.	63 0	20 7	90,000 (G.)	Brest	1927	1930	1,210,000	..	..	8 *8-in.*, 8 *3-in.* A.A., 8 *1-pr.* A.A., 12 M., 3 seaplanes, 2 catapults	2 triple 21″	32	— / 1800	605
Duquesne Class	Tourville Duquesne	10,000	626 8	62 4	20 7	120,000 (G.)	Lorient Brest	1926 1925	1928	..	..	..	8 *8-in.*, 8 *3-in.* A.A., 8 *1-pr.*, 2 seaplanes, 1 catapult	2 triple 21″	33·2	— / 2000	620
Duguay-Trouin Class	Duguay-Trouin Primauguet La Motte Picquet	7249	594 10	56 6	17 0	110,000 (G.)	Brest Brest Lorient	1923 1924 1924	1926 1927 1927	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 2 *3-pr.*, 2 M., 1 L., 1 seaplane, 1 catapult	4 triple 21·7″	33	— / 1480	578

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cr.	*Strasbourg (*ex*-German Regensburg)	4723	468	1	45	0	17	0	26,000 32,500t P.T.	Bremen(Weser)	1914	1914	417,810	4–2½	2	7 *5·9-in.*, 1 *3-in.* A.A., 4 M., 120 mines.	4 19·7 a.w.	26·0	1200/423	438
M.Cr.	Emilé Bertin	5886	580	0	52	5	16	4	100,000–120,000 P.T. (G.)	Penhoet, St. Nazaire	1933	1934	..	..	..	9 *6-in.*, 4 *3·5-in.* A.A., 8 *1-pr.*, 250 M., 1 catapult, 2 aircraft.	6 21·7″ a.w. (T.)	34·0	oil	550
„	Pluton	4773	498	9	49	3	17	0	57,000 (G.)	Lorient	1929	1931	..	..	..	4 *5·5-in.*, 10 *1-pr.*, 12 M., 1000 mines.	—	30·0	oil	..

NOTE.—The new building programme includes 2 cruisers. * To be sold.

RIVER GUNBOATS.—Francis Garnier (1929), 639 tons, 15 knots, two 4-in., one 3-in. A.A.; Vigilante, Argus (1924), 218 tons 12 knots, two 3-in; Balny (1921), 201 tons, 14 knots, one 3-in.; La Grandière (1921), 39 tons, 11 knots; Doudart de Lagrée (1909), 183 tons, 14 knots; Mytho, Tourane (1934), 95 tons, 250 H.P. (Diesel), 10 knots, one 3-in.; Chaloupe Fluviale (1926), 38 tons, 9 knots, 1 small gun; Avalanche and Commandante Bourdaise (1920), 128 tons, 16.5 knots, one 3-in. gun.

GUNBOAT.—Jouffroy d'Abbans, 400 tons, 15 knots, 2-3 in., building.

MINESWEEPERS.—Conquérante (1918), 374 tons, 17 knots, two 3·9-in.; Luronne (1917), 265 tons, 13·8 knots, two 3·9-in.; Impétueuse, Batailleuse, Audacieuse (1917), 265 tons, 15 knots, two 3·9-in.; Engageante, Diligente (1917), 360 tons, 17 knots, two 3·9-in.; Agile, Inconstant. Ardent (1916), 310 tons, 17 knots, two 3·9-in.; Étourdi (1916), 310 tons, 17 knots, two 3·9-in.; Gracieuse, Dédaigneuse, Tapageuse, Surveillante (1916), 315 tons, 15 knots, two 3·9-in.; Granit, Mica, Meulière, Quartz (1918), 354 tons, 12·5 knots, one 9-pr. Four minesweepers included in the 1936 programme viz., Commandant Bory, Commandant Delage, Commandant Duboc and Commandant Riviere.

MINELAYERS.—Castor, 3,150 tons, 14 knots, three 3·9-in., two 1·5 A.A.; Pollux, 2,460 tons, 14 knots, three 3·9-in. Both converted 1930.

SUBMARINE PARENT SHIP.—Jules Verne (1931), 5,747 tons, 7,000 H.P. (Diesel), 16 knots, mounting four 3·5-in. A.A., four 1-pdr. A.A.

SLOOPS.—Bougainville, Dumont D'Urville, Savorgnan de Brazza, and d'Entrecasteaux (1932–1933). Rigault-de-Genouilly Amiral Charner, and D'Iberville (1933–1935), 1970 tons, 3,200 H.P. (Diesel), 17 knots, armament three 5·5-in., four 1·5-in. A.A., 6 M., 50 mines, 1 seaplane. Ville d'Ys (1917) (on fishery protection duties), 1,122 tons, 17 knots, mounting one 3·9-in., three 3-in. (1 A.A)., 2 M.; Régulus (1917), Antares, Aldébaran, Bellatrix, Algol, Altair (1916), 1122 tons, 17 knots, mounting two 5·5-in., two 3-in. A.A., 2 M.

DESPATCH VESSELS.—Duperré Class:—Du Couedic, Enseigne Henry, Duchaffault, Dubourdieu (1919-1920), 453 tons, 17 knots, one 5·4-in., one 3·9-in. "Arras" Class:—Reims, Remiremont, Révigny, Belfort, Calais, Lassigny, Les-Eparges, Vauquois, Vimy, Ypres, Epinal, Nancy, Coucy, Laffaux, Amiens, Tahure, Arras, Bapaume (1919–1923), 644 tons, 20 knots, two 5·4-in., one 3-in. A.A. guns (Belfort detached to Air Ministry—no armament, and Ypres employed on hydrographic work—no armament. "Aisne" Class:—Ailette, Ancre, Scarpe, Suippe, Meuse, Yser, Somme, Oise, Aisne, Marne (1917–1918), 490–600 tons, 21 knots, four 3·9-in. guns. Quentin-Roosevelt for fishery protection (1918), 586 tons, 13 knots, one 3-in gun. Four Avise dragueurs Elan, Chamois, Chevreuil and Gazelle of 640 tons, 20 knots, two 3·9-in. guns, laid down in 1936, and four vessels are projected.

NET-LAYERS.—Le Gladiateur, (1934), 2,300 tons, 387 feet long, 7,700 H.P., 21 knots, four 3·5 in. A.A., 6 M. A second is projected.

ESCORTEURS (Convoy Sloops).—Bayonnaise, Cordelière, Poursuivante, Incomprise, Melpomene, Flore, Pomone, Iphigenie, Branle-Bas, Bombarde, Bouclier and Baliste (1936), 600 tons, two 3·9-in. guns, 2 A.A., m.g., 2 single and 1 twin 16-in. torpedo tubes, 22,000 H.P., 34½ knots.

SURVEYING SHIPS.—Amiral Mouchez, 800 tons, 12 knots. La Péronne and Beautemps-Beaupré (1920), 780 tons, one 3-pdr. A.A. Astrolabe, Octant, and Gaston-Rivier (1918), 460 tons, 10 knots; Soudé (1911), 50 tons, 10 knots; Chimère (1901), 330 tons, 14 knots; Utile (1894), 450 tons, 13 knots, one 3-pdr.

C.M.Bs.—V.T.B. 1 (1922) (55 feet), 10 tons, 37 knots; V.T.A. 1 (1921) (50 ft.), 5 tons, 37·6 knots. V.T.A. 2 (1929), 6 tons; V.T.B.'s, 45 and 7, 11 tons, 1000 H.P., 39 knots, two torpedoes; V.T.B.'s 8, 9 and 10, 19 tons, 2000 H.P., 46 knots.

SUBMARINE CHASERS.—Nos. 1-4 (1935), 148 tons, 2,400 H.P., 20 knots, one 3-in gun. Twenty-seven in number (1918), 70 tons, 16 knots, one 3-in gun.

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GERMANY.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Battleship	35,000	..	..	..	..	Hamburg	Bldg.	..	..	..	..	..	..	..	..	*15*-inch.	..	30	..	..
b.	Battleship	35,000	..	..	..	..	..	Bldg.	..	..	..	..	..	..	..	..	*15*-inch.	..			
b.	Scharnhorst	26,000 (standard)	..	..	..	..	Wilhelmshaven	1936	Bldg.	..	..	..	..	..	..	..	9 *11-in.*, 12 *5·9-in.*, 6 *4*-in. A.A.	..	..	..	..
b.	Gneisenau		..	..	..	..	Kiel	Bldg.	..	..	..	..	..	..	..	..		..	30	..	..
b.*	Deutschland	10,000 (standard)	609	67	6 19	0	Deutsche Werke, Kiel	1931	1933	estimated 3,750,000	about 4	1½–3	—	—	about 7	—	6 *11-in.*, 8 *5·9-in.*, 6 *3·4-in.* A.A., 8 *1-pr.*	8 19·7″ (Q.)	26	— 1200	634
b.*	Admiral Scheer					54,000 -56,800 Diesel ‡	Wilhelmshaven	1933	1934	estimated 3,530,000											
b.*	Admiral Graf Spee						Wilhelmshaven	1934	1936	estimated 3,530,000					—						
b.	Hannover †	13,040	413 1	72 10	25 3	17,000 T.S. recip.	Wilhelmshaven	1905	1907	1,157,500	9½–4 K.S.	3	8 K.S.	6 K.S.	10–6 K.S.	6¾ K.S.	4 *11-in.*, 14 *6·7-in.*, 4 *3·4-in.* A.A., 23 M.	4 a.w. 19·7″	18	1771 / 197	727
b.	Hessen	12,988	413 5	72 10	25 3	16,000 T.S. recip.	Kiel (Germania)	1903	1905	1,157,500	9–4 K.S.	3	6 K.S.	6 K.S.	10–6 K.S.	6 K.S.	4 *11-in.*, 12 *6·7-in.*, 4 *3·4-in.* A.A., 23 M.	4 a.w. 19·7″	18	1574 / 197	727
b.	Schlesien †	13,040	413 1	72 10	25 3	17,000 T.S. recip.	Schichau Germania	1906	1908	1,214,000	9½–4 K.S.	3	8 K.S.	6 K.S.	11–6 K.S.	6¾ K.S.	4 *11-in.*, 12 *5·9-in.*, 4 *3·5-in.* A.A., 23 M.	4 a.w. 19.7″	18	1771 / 197	727
b.	Schleswig-Holstein †																				

* Officially rated as "Armoured Ships."
Two aircraft carriers of 19,000 tons are building.

† Reconstructed 1925–30.

‡ Consists of eight double acting two-stroke M.A.N. Diesels.

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GERMANY.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam. (Extreme.)	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Maker of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.						£	in.	in.			knots.	tons.	
h.c.	J . . .																	
h.c.	G . .	10,000	..	..	..	..	..	..	laid down 1935	..	..	..	..	9 *7·9-in.*	..	..	.. / —	..
h.c.	H . .																	
l.c.	Leipzig . .	6000	543 10 (on W.L.)	53 5	15 7	72,000† [geared turbines 60,000, Diesels 12,000]	Wilhelmshaven	..	1929	1931	2,050,000	3–4	..	9 *5·9-in.*, 6 *3·4-in.* A.A.	4 triple *19·7-in.* a.w.	32	1500 / — (including Diesel oil)	534
l.c.	Nürnberg . .	6000	..	..	..	72,000	Kiel	..	1934	1935	..	..	..	9 *5·9-in.*, 8 *3·4-in.* A.A.	4 triple *19·7-in.* a.w.	32	..	..
l.c.	Köln . .						Wilhelmshaven	..	1928	1930	1,785,000							
l.c.	Karlsruhe	6000	570 10	49 10	17 8	65,000‡	Deutsche Werke, Kiel	..	1927	1929	1,985,000	3–4	..	9 *5·9-in.*, 4 *3·4-in.* A.A.	4 triple *19·7-in.* a.w.	32	— / 1200	500
l.c.	Königsberg						Wilhelmshaven	..	1927	1929	2,100,000							
l.c.	Emden * . .	6000	510 2	46 11	17 4	46,500 (G.)	Wilhelmshaven	..	1925	1925	..	3	..	8 *5·9-in.*, 3 *3·4-in.* A.A.	2 twin *19·7-in.* a.w.	29	1100 / 700	483

ESCORT VESSELS.—10 building, 2–4 in. 2 m.g. 15 patrol vessels building, 1 m.g. 2–20 in. T.T.

GUNNERY TRAINING SHIPS.—Drache (1908), 778 tons, 15 knots, 4 4.1-in.; Fuchs (1919), 517 tons, 16 knots, 2 4·1-in. Gunnery Tender Bremse (Wilhelmshaven, 1932), 1,250 tons, 339½ feet long, 31 ft. 2 in. beam, 25,000 H.P. (Diesel), 27 knots, 4 4·1-in. guns, complement 112. Brummer (1936), 2,500 tons, 27 knots 4 4-in. guns.

FISHERY PROTECTION VESSELS.—Weser and Elbe (Wilhelmshaven, 1931), 590 tons, 1600 H.P. (Diesel), 15 knots; Zieten (1919), 541 tons, 17 knots.

EXPERIMENTAL VESSELS.—Pelican and Nautilus (500 tons, 17 knots), Grille (470 tons, 10 knots).

MINESWEEPERS.—29 in number (reciprocating machinery). 475–525 tons, 16 knots. Six are projected.

SAILING TRAINING SHIP.—Gorch Fock (Hamburg, 1933) (replacing the Niobe). Three-masted barque, 239 feet in length, 1,500 tons, 500 H.P. auxiliary motor giving 8 knots.

BARRAGE CRAFT.—R 1—8 (1933), 85 ft., 44 tons, 700 H.P., 17½ knots. Mining and Barrage vessels MT 1 and 2, 550 tons, 10 knots; 12 small craft.

PATROL OR GUARD BOATS.—S 1—6 (1932), 92 ft., 46 tons, 2,400 H.P., 31½ knots. UZ 27—35, 102 ft.. 60 tons, 500 H.P., 14 knots. UZ 15, 17, 18, 21, 10 tons, 25 knots.

TARGET SHIP.—Zähringen (ex-battleship), 11,800 tons. Wireless controlled. TARGET TUGS AND CONTROL SHIPS.—Pfeil and Blitz, 650 tons. 30 knots *ex* T.B.'s. Blitz is control ship for Zähringen.

FLEET TENDERS.—Hela, Nordsee. STATION TENDERS.—Nixe, Frauenlob.

SURVEYING VESSELS.—Meteor (1924), 1150 tons, 11 knots, one 3·4-in., and two surveying launches, 90 tons.

* Training Ship. Being converted to oil fuel burning.

† Three propeller shafts, of which the centre shaft is Diesel-driven and the outers turbine-driven. Diesels used for cruising or combined with the turbines to give full speed.

‡ Parsons geared turbines with Diesels for cruising.

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GREECE.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
a.c.	Giorgios Averoff *	9301	462	69	24¾	19,000 (21,500 *t*) B.	Leghorn (Orlando)	1910	1911	1,100,000	8–3½ K.S.	1¾	7	7	8–6½	7	4 *9·2-in.*, 8 *7·5-in.*, 16 *3-in.*, 4 *3-pr.*, 2 *3-in.* A.A., 2 M.	3 (sub.) *18-in.*	22½ (24 *t.*) ‡	1500 / —	..
cr.	Helle † (*ex* Fei-Hung)	2083	322	39	14	6000 P.T. (G.)	Camden, N.J.	1912	1914	240,000	..	1¼	..	..	..	..	3 *6-in.*, 1 *3-in.* A.A., 110 mines	2 a.w. *18-in.*	20 ‡	600 / 100	230

* Retubed and refitted 1927. † Repaired and converted to oil burning in France and fitted as a minelayer in 1929. ‡ Probable speed 15 knots.

Old gunboat (gunnery school tender), Amvrakia, 470 tons. Training ship, Ares, 1,870 tons, 10 knots, four 3-in. guns, completed at Chantiers de la Méditerranée, la Seyne, 1929. Repair ship, Hephestos (1920), 4,549 tons gross, 11½ knots. Surveying ship (old sloop), Nautilus, 400 tons, 11 knots, two 3-in guns. Dispatch vessels, Korghia Lenios (1916), 380 tons, 13½ knots, and Kichli (1884), 86 tons, 10 knots. C.M.B's., two Thornycroft type, 55 ft. 4 built at Venice, 69 ft., for Customs Service. One light cruiser projected.

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ITALY.—Battleships.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Littorio	35,000	774 0	103 8	28	125,000 (G.T.)	Genoa (Ansaldo)	Bldg.	..	..	10	..	..	..	..	..	9 *15-in.*, 12 *6-in.*, 12 *3·5-in.* A.A., 2 catapults, 4 aircraft.	..	30	..	..
b.	Vittorio Veneto						Trieste														
b.	Andrea Doria	21,555	575 9	92 0	29	34,000 P.T. Y.	Spezia	1913	1916	..	10–4 K.S.	1¾	6 K.S.	..	9½ K.S.	6 K.S.	13 *12-in.*, 16 *6-in.*, 13 *3-in.*, 6 *3-in.* A.A., 2 *2-pr.*, 6 M., 4 L., 1 catapult, 1 aircraft	2 (sub.) *18-in.*	21	1200 / 800	1074
b.	Caio Duilio					31,000 P.T. Y.	Castellammare	1913	1915												
b.	Conte di Cavour‡	23,622	629 0	92 0	29	..	Spezia	1911	1915	..	10–4½ K.S.	1¾	6 K.S.	..	9½ K.S.	5 K.S.	10 *12·6-in.*, 12 *4·7-in.*, 8 *3·9-in.* A.A., 20 A.A. M.G., 2 catapults, 4 aircraft.	..	27	..	..
b.	Giulio Cesare ‡	23,622	629 0	92 0	29	..	Genoa (Ansaldo)	1011	1914	..	10–4½ K.S.	1¾	6 K.S.	..	9½ K.S.	5					
§	Pisa †	8759	460 11	68 11	24¾	21,000 recip. Belleville	Leghorn (Orlando)	1907	1909	..	8–3 K.S.	1¾	7 K.S.	7 K.S.	8–6 K.S.	6½	4 *10-in.*, 8 *7·5-in.*, 12 *3-in.*, 6 *3-in.* A.A., 2 *3-pr.*, 4 M., 2 L.	2 (sub.) *18-in.*	23	1486 / 138	687
§	San Giorgio	9232	462 2	69 0	24¾	19,000 recip. Bl. 23,000 P.T. B.	Castellammare	1908	1910	..	8–3 K.S.	1¾	7 K.S.	7 K.S.	7–6 K.S.	7 K.S.	4 *10-in.*, 8 *7·5-in.*, 10 *3-in.*, 6 *3-in.* A.A., 2 *3-pr.*, 6 M., 2 L.	2 (sub.) *18-in.*	23 / 32½	1556 / 115 / 1550 / 66	643
§	San Marco **	9350							1911												

† Cadets training ship. To be boys' training ship.
‡ As modernised 1936—1937. Lengthened 52 ft. and amidship triple turret removed.
§ Armoured Cruisers, classified as Battleships, 2nd class, in Italian Official Lists. ** Converted into target ship under wireless control.

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ITALY.—Cruisers, &c.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Side. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft.					£	in.	in.			knots.	tons.	
Improved Condottieri Class	Duca degli Abruzzi Guiseppe Garibaldi	7894	593 8	57 5	15	100,000	Cantieri Riuniti dell' Adriatico, Trieste Odero-Terni, Orlando Spezia	1935	Bldg.	..	..	..	10 *6-in.*, 8 *3·9-in.*, 8 *1·5-in.* A.A., 8 M., 4 aircraft.	6 21″	35	..	..
Attendolo Class	Eugenio di Savoia Filiberto Duca d'Aosta	6791	613 4	57 5	15	110,000	Ansaldo, Genoa Orlando, Leghorn	1933	1936	..	..	..	8 *6-in.*, 6 *3·9 in.*, 8 *1-pr.* A.A., 8 M., 1 catapult, 3 aircraft	6 21″	36½	..	.
Zara Class	Pola	10,000	600 0	67 8	20·2	95,000 (G.)	Orlando, Leghorn	1931	1933	..	Abt. 6	..	8 *8-in.*, 16 *3·9-in.* A.A., 16 smlr., 1 catapult, 2 aircraft	—	32 (33 t.)	oil	840
Condottieri Class	Montecuccoli Muzio Attendolo	5857	597 0	54 6	14·2	110,000	Ansaldo, Genoa Trieste	1933 1934	1935	.	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 *1-pr.* A.A., 8 M.	4 21″	37	oil	..
Zara Class	Gorizia	10,000	600 0	67 8	20·2	95,000 (G.)	Orlando, Leghorn	1930	1931	..	Abt. 6	..	8 *8-in.*, 16 *3·9-in.* A.A., 12 smlr., 1 catapult, 2 aircraft	8 21″	34	oil	840
Modified Trento Class	Bolzano	10,000	646 0	67 8	..	150,000	Ansaldo, Genoa	1932	1933	..	..	..	8 *8-in.*, 16 *3·9-in.* A.A., 12 smaller, 1 catapult, 2 seaplanes.	8 21″	36	oil	..
Condottieri Class	Armando Diaz Luigi Cadorna	5008	554 6	50 10	14	95,000 (G.)	Odero-Terni, Spezia Stabilimento Tecnico Triestino, Trieste	1932 1931	1933	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 M, 1 catapult, 2 seaplanes	4 21″ (D.)	37 (39¾ t.)	oil	..
Zara Class	Zara Fiume	10,000	599 10	67 8	20·2	95,000 (G.)	Odero-Terni, Muggiano Stabilimento Tecnico Triestino, Trieste	1930	1931	..	4 / —	..	8 *8-in.*, 16 *3·9-in.* A.A., 16 smaller, 1 catapult, 2 aircraft	—	32	2200	800
Condottieri Class	Alberto di Giussano Alberico da Barbiano Bartolomeo Colleoni Giov. delle Bande Nere	5069	556 5	50 10	14·2	95,000 (G.)	Ansaldo, Sestri-Ponente Castellamare	1930	1931 1931 1932 1932	..	..	..	8 *6-in.*, 6 *3·9-in.* A.A., 8 *1-pr.*, 8 M., 1 catapult, 2 seaplanes	4 21″ (D.)	37	oil	500

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Trento Class	Trieste ‡ Trento	10,000	646 2	67 9	18	150,000 (G.)	Orlando, Leghorn Stablemento Tecnico, Trieste	1926 1927	1929	..	$\frac{2\frac{3}{4}}{2}$	..	8 *8-in.*, 16 *3·9-in.* A.A., 4 *1-pr.*, 8 M., 1 catapult, 2 seaplanes.	8 a.w. (D.)	35 36	— 3000	1000 800
l. c.	Ancona (*ex* German Graudenz)	3838	468 3	45 0	$13\frac{1}{2}$	30,000 tur.	Kiel	1913	1915	..	$\frac{4-2\frac{1}{2}}{1}$	..	7 *5·9-in.*, 3 *3-in.* A.A., 3 M., 120 mines, 1 catapult	2 19·7″	27·5	$\frac{1279}{400}$	364
„	Bari (*ex*-German Pillau)	3248	443 11	44 7	$13\frac{1}{2}$	28,000 tur.	Danzig (Schichau)	1914	1915	..	$\frac{—}{1\frac{1}{2}-\frac{3}{4}}$	1	8 *5·9-in.*, 3 *3-in.* A.A., 3 M., 120 mines	2 19·7″	27·5	$\frac{984}{250}$	372
„†	Brindisi (*ex*-Austrian Helgoland)	2756	428 7	41 11	13	25,600 tur.	Fiume	1912	1914	..	$\frac{2\frac{1}{2}}{\frac{3}{4}}$	..	9 *3·9-in.*, 1 *3-in.* A.A., 3 M., 1 L., 170 mines	4	27·0	$\frac{750}{—}$	330
„	Libia	3700	367 0	47 6	16	11,500 recip.	Genoa (Ansaldo)	1912	1913	..	$\frac{—}{1\frac{1}{2}}$	..	8 *4·7-in.*, 3 *3-in.* A.A., 3 M.	..	22·9	$\frac{640}{—}$	317
l. cr. †	Quarto	2904	431 9	42 2	$13\frac{1}{4}$	29,000 P.T. Bl.	Venice	1911	1912	..	$\frac{—}{1\frac{1}{2}-\frac{3}{4}}$	..	6 *4·7-in.*, 4 *3-in.*, 2 *2-pr.* A.A., 3 M., 126 mines	2 a.w. 18″	28	$\frac{49}{482}$	256
l. cr.	Taranto (*ex*-German Strassburg)	3184	455 0	42 2	$12\frac{1}{4}$	27,000 P.T. T.S.	Wilhelmshaven	1911	1914	416,340	$\frac{4-2\frac{1}{2}}{—}$	2	7 *5·9-in.*, 2 *3-in.* A.A., 3 M., 120 mines	2 19·7″	27	$\frac{1200}{—}$	373
l. cr.†	Venezia (*ex*-Austrian Saida)	2756	428 7	41 11	13	25,600 tur.	Monfalcone	1912	1914	..	$\frac{2\frac{1}{2}}{\frac{3}{4}}$	..	9 *3·9-in.*, 1 *3-in.* A.A., 3 M.	4	27·0	$\frac{750}{—}$	330
s.c.	Miraglia *	4882	397 0	49 3	17	12,000 P.T.	Spezia	1923	1927	..	..	..	4 *4-in.* A.A., 1 M., 2 catapults, 16 planes	—	21·5	$\frac{—}{440}$	300

* *Ex*-merchant ship, taken over on the stocks. † Classified as Scouts in Italian Lists. ‡ Fleet Flagship.

COMBINED MINELAYERS AND MINESWEEPERS.—Fasana, Buccari, Durazzo, and Pelagosa, completed 1926, 531 tons, 11 knots (I.C. machinery), 1 *3-in.* gun, 200 mines; Azio, Legnano, Lepanto, Dardanelli, Milazzo, and Ostia, completed 1926–7, 615 tons, 15 knots (recip.), 2 *4-in.*, 1 *3-in.*, 200 mines.

MINELAYERS.—Marghera and Brondobo, 117 tons, 13 knots, 1 *3-in.*, 60 mines; Laurana, Rovigno, and Albona (*ex*-Austrian), 112 tons, 11 knots, 1 *3-in.*

MINESWEEPERS.—Cotrone, Viesti, 475 tons, 13·8 knots, 2 *4-in.* guns; 38 in No., 200 tons, 14 knots, 1 *3-in.* gun

OIL TRANSPORTS.—Marte, Dalmazia, Istria, Livenza, Urano, Prometeo, Cocito, Lete, Stige, Niobe, Cerere, Giove, Tarvisio, Quarnero. Oil transport with under-water protection, Brennero, 10,000 tons, $10\frac{1}{2}$ knots.

GUNBOAT, Arimondi (1910), 432 tons, 9 knots, 2 *3-in.* A.A. guns. RIVER GUNBOATS.—S. Caboto (1912), 863 tons, 13 knots, 6 *3-in* guns; E. Carlotto (1918), 180 tons, 14 knots, 2 *3-in.* A.A. guns. ESCORT GUNBOATS.—A. Bafile, T. Farinati, E. Giovannini, C. del Greco, and A. Vitturi (1922), 182 tons, 23 knots, 2 *4-in.* guns, 2 T.T.

SURVEYING VESSELS.—Ammiraglio Magnaghi (1914), 1800 tons, 14 knots, 4 *3-in.*; Cariddi (1916), 330 tons, 10 knots: Scilla (1916), 350 tons, 11 knots; Tritone (1913), 340 tons, 10 knots. 42 ARMED MOTOR BOATS (M.A.S.) built and 6 under construction

PATROL VESSELS.—Cherso and Lussin (1912), 4000 tons, $10\frac{1}{2}$ knots; Lante and Bianco (1917), 280 tons, 12 knots; Lutti and Cirene (1912), 340 tons, 10 knots; Corsini (1912), 290 tons, 12 knots; Rimini (1912), 319 tons, $9\frac{1}{2}$ knots; Gallipoli (1911), 310 tons, $10\frac{1}{2}$ knots; Otranto (1911), 290 tons, 10 knots; Giannutri (1912), 680 tons, 13 knots; Alula (1912), 308 tons, 13 knots.

TRAINING SHIPS.—Cristoforo Colombo (Castellamare, 1928), 3,000 tons, 10 knots (Diesel-electric); Amerigo Vespucci (Castellamare, 1931), 3,543 tons, 1,800 H.P. (Diesel-electric), 11 knots, 4 *3-in.* A.A. SUBMARINE DEPÔT SHIPS (Sloops).—Volta and Pacinotti (1924), 2,362 tons, 19 knots, 1 *4-in.*, 2 *4-in.* A.A.

OLD CRUISER.—F. Ferrucio (1905), 6,299 tons, 13,500 H.P. (recip.), 19·3 knots. CABLE SHIP.—Citta di Milano (5,500 tons), 10 knots.

One submarine chaser, Albatros, 340 tons, $24\frac{1}{2}$ knots, 2 *3·9-in.* and 1 *1·5-in.* A.A., building at Palermo.

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JAPAN.—Battleships.

Type.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft. ins.	ft. ins.	ft. ins.						in.	in.	in.	in.	in.	in.			knots.	tons.	
Fuso Class	Fuso §	29,330	673 0	94 0	28 6	40,000 B.C.T.	Kure	1914	1915	..	12·4 K.S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 16 *6-in.*, 8 *5-in.* A.A., 4 M., 4 L., 1 seaplane	2 (sub.) *21-in.*	22·5	4000 / 1300	1300
	Hyuga	29,990	683 0	94 0	28 8	45,000 tur.	Nagasaki (Mitsubishi)	1917	1918								12 *14-in.*, 18 *5·5-in.*, 4 *3-n.* A.A., 2 M. H A., 2 seaplanes, 1 catapult	6 (sub.) (D) *21-in.*	23	4500 / 1300	1360
	Ise	29,990	683 0	94 0	28 8	45,000 B.C. tur.	Kobe (Kawasaki)	1916	1917	..	12 K.S.	3	8 K.S.	..	12 K.S.	6 K S.	12 *14-in.*, 18 *5·5-in.*, 6 *3-in.* A.A., 2 M. H.A., 2 seaplanes	6 (sub.) (D) *21-in.*	23	4500 / 1300	1360
	Yamashiro §	29,330	673 0	94 0	28 6	40,000 B.C.T.	Yokosuka	1915	1917	..	12 K S.	3	8 K.S.	..	12 K.S.	6 K.S.	12 *14-in.*, 16 *6-in.*, 8 *5-in.* A.A., 4 M., 4 L., 1 seaplane	6 (sub.) *21-in.* (D)	22·5	4000 / 1300	1272
Kongo Class	Haruna ‡	29,330	704 0	95 0	27 6	64,000 P.T.	Kobe (Kawasaki)	1913	1915	..	8–3 K.S.	2¾	6	.	10 K.S.	6 K.S.	8 *14-in.*, 16 *6-in.*, 8 *5-in.*, A.A., 4 M., 4 L. 1 seaplane	4 (sub.) *21-in.*	26	— / 4000	1250
	Kirishima ‡	29,330	704 0	92 6	27 6	64,000 P.T.	Nagasaki (Mitsubishi)	1913	1915	..											
	Kongo ‡	29,330	704 0	92 0	27 6	64,000 P.T.	Barrow	1912	1913	2,500,000											
Nagato Class	Mutsu †	32,720	700 0	95 0	31 0	80,000 (G.)	Yokosuka	1920	1921	..	12–9 K.S.	3½	..	..	14	..	8 *16-in.*, 20 *5·5-in.*, 8 *5-in.* A.A., 3 M., seaplanes (Mutsu 2, Nagato 3)	4 (sub.) 4 a.w. *21-in.*	23	1600 / 3400	1304
	Nagato †						Kure	1919	1920												1367 (as fleet flagship)

NEW CONSTRUCTION. It is anticipated that Japan will lay down two 35,000 ton battleships in 1937.

ARMOURED CRUISERS now rated as COAST-DEFENCE SHIPS (1st class), completed 1899–1904: Nisshin, 7080 tons, 20 knots, 4 8-in., 14 6-in.; Kasuga, 7080 tons, 20 knots, 1 10-in., 2 8-in., 14 *6-in.*; Yakumo, 9010 tons, 20 knots, 4 8-in., 12 6-in.; Adzuma, 8640 tons, 20 knots, 4 8-in., 12 6-in.; Idzumo and Iwate, 9180 tons, 16 knots, 4 8-in., 14 6-in.; Asama, 9240 tons, 21½ knots, 4 8-in., 12 6-in.; Tsushima (2nd class), 3120 tons, 20 knots, 6 6-in., 8 3-in., 1 3-in. A.A.

§ Modernised 1934. † Being modernised.

‡ Modernised 1928–1931, including fitting of bulges and new foremast, and conversion to oil burning. Hiyei of this class has been de-militarised and converted to a training ship in accordance with London Naval Treaty.

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JAPAN.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Side / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft. ins.					£	in.	in.			knots.	tons.	
A.C.	Akagi *	26,900	763 b.p.	92	21 2	131,200 (G.)	Kure	1925	1927	..	..	..	10 *8-in.*, 12 *4·7-in.* A.A., capacity for 50 aircraft. Carries about 30 aircraft	—	28·5	4000	..
A.C.	Hosho †	7470	510 b.p.	48	15 0	30,000 (G.)	Tsurumi (Asano)	1921	1922	..	..	..	4 *5·5-in.*, 2 *3-in.* A.A., 26 aircraft	—	25	— / 2700	550
S.C.	Kamoi §	17,000	495 b.p.	67	28 0	8,000 turbines and electric drive	New York S.B. Co.	1922	1922 (converted 1933)	..	..	..	2 *5·5-in.*, 16 seaplanes	—	15	4000	..
A.C.	Kaga ‡	26,900	715 b.p.	102½	22 1	91,000	Kobe (Kawasaki)	1921	1928	..	..	..	10 *8-in.*, 12 *4·7-in.* A.A., capacity for 60 aircraft. Carries about 30 aircraft	—	25	— / 5300	..
S.C.	Notoro §	14,050	455 b.p.	58	26 6	5,850 recip.	Kobe (Kawasaki)	1920	1920	.	..	..	2 *4·7-in.*, 2 *3-in.* A.A., 16 seaplanes	—	12	— / 1000	..
A.C.	Ryujo	7100	548	60′ 8″	15′ 0″	40,000 (G.)	Yokohama	1931	1933	..	..	..	12 *5·1-in.*, A.A., 24 aircraft	—	25	oil	600
A.C. A.C.	Soryu Hiryu	10,050	688	68′ 4″	16′ 6″	60,000	Kure Yokosuka	1935 Bldg.	Bldg. ..	..	..	..	12 *5-in.*, A.A.	—	30	..	..
S.C. S.C.	Chitose Chioda	10,000	..	..	..	..	Kure	Bldg.	..	..	..	..	..	—	..	..	..

* Designed as a battle cruiser. † Fitted with gyro-stabiliser. ‡ Designed as a battleship. § Converted from oilers. Seaplane carriers. Other vessels carry landplanes.

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JAPAN.—Cruisers.

Class.	NAME.	Standard Displacement.	Length (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost	Armour. Side. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
	Tone	8500	614 3 w.l.	63·1	14·7	90,000	Nagasaka	Bldg.	..	..	..	..	15 *6·1-in*, 8 *5-in.* A.A.	..	..	..	..
	Tikuma	8450	..	..	..	..	.. .. ..	Bldg.	..	..	..	..	.. ..	..	..	..	..
Mogami Class	Mogami Mikuma Suzuya Kumano	8500	625 w.l.	59½	13·1	90,000	Kure Nagasaki Yokosuka Kawasaki	1934 1934 1934 1936	1935 1935 1936 1937	2,500,000 estimated	..	..	15 *6·1-in.*, 8 *5-in.* A.A., 2 catapults, 4 aircraft.	12 21-in. a.w. (T.)	33	..	..
Myoko Class	Chokai. Maya Atago Takao	9850	650	62½	16½	100,000 (G.)	Nagasaki Kobe Kure Yokosuka	1931 1930 1930	1932 1932	..	3 / —	..	10 *8-in.*, 4 *4·7-in.* A.A., 2 M. 2 catapults, 2 seaplanes	8 21-in. a.w. (D.)	33	oil	692
Nachi Class	Ashigara Haguro Myoko Nachi	10,000	630 b.p.	62½	16½	100,000 (G.)	Kobe Nagasaki Yokosuka Kure	1928 1927	1929 1929 1929 1928	..	3 / —	..	10 *8-in.*, 6 *4·7-in.* A.A., 2 M., 1 catapult, 2 seaplanes	12 21-in. a.w. (T.)	33	— / 2500	692
Furutaka Class	Kinugasa Aoba Furutaka Kako	7100	595	51	15¼	95,000 (G.)	Kawasaki, Kobe Nagasaki „ Kawasaki, Kobe	1926 1926 1925 1925	1927 1927 1926 1926	..	..	..	6 *8-in.*, 4 *4·7-in.* A.A., 2 M., 1—2 planes, 1 catapult 6 *8-in.*, 4 *3-in.* A.A., 2 M., 2 planes, 1 catapult	12 21-in. a.w.	33	400 / 1400	604
Chikuma Class	Hirado Yahagi	4400	475	46½	16¾	22,500 I.T.	Kobe Nagasaki	1911	1912	..	2¼ / —	..	8 *6-in.*, 2 *3-in.*, 2 *3-in.* A.A., 2 M.	3 18-in. a.w.	26	900 / 300	410
Natori Class	Abukuma Isudzu Nagara Natori	5170	535	47¼	15¾	90,000 (G.)	Uraga Uraga Sasebo Nagasaki (Mitsubishi)	1923 1921 1922 1922	1925 1923 1922 1922	..	2 / —	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult	8 21-in. a.w. (D.)	33·0	300 / 1260	450

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Natori Class	Yura Kinu	5170	535	47¼	15¾	90,000 (G.)	Sasebo Kawasaki	1922 1922	1923 1922	..	2 / —	..	7 *5·5-in.* 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult	8 21-in. a.w (D.)	33·0	300 / 1260	450
Sendai Class	Jintsu Naka Sendai	5195	535	47¼	15¾	90,000 (G.)	Kawasaki Yokohama Nagasaki	1923 1925 1923	1925 1925 1924	..	2 / —	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 1 catapult	8 21-in.	33·0	300 / 1260	450
Kuma Class	Kiso Kitakami Kuma Oi Tama	5100	535	47¼	15¾	90,000 (G.)	Nagasaki Sasebo Sasebo Kobe Nagasaki (Mitsubishi)	1920 1920 1919 1920 1920	1921 1921 1920 1921 1921	..	2 / —	..	7 *5·5-in.*, 2 *3-in.* A.A., 2 M., 1 seaplane, 80 mines	8 21-in. a.w. (D.)	33·0	300 / 1260	439
Tenryu Class	Tatsuta Tenryu	3230	468	40¾	13	51,000 (G.)	Sasebo Yokosuka	1918	1919	..	..	..	4 *5·5-in.*, 1 *3-in.* A.A., 2 M. Fitted for minelaying.	6 (T.)	31	— / 900	332
—	Yubari	2890	435 b.p.	39½	11¾	57,000 (G.)	Sasebo	1923	1923	..	..	..	6 *5·5-in.*, 1 *3-in.* A.A., 2 M. 34 mines	4 21-in. a.w. (D.)	33	— / 820	328

* A replenishment programme of new construction is projected to cover a period of 3 or 4 years and comprising 2 cruisers (8500 tons), 2 aircraft carriers (10,000 tons), 14 destroyers (1400 tons), 6 submarines (of a total tonnage of 7500 tons), a minelayer (5000 tons), 8 torpedo boats.

MINELAYERS.—Matsushima (440 tons); Sarushima; Nashimi, 443 tons, 19 knots, 2 3-in; Katsuriki (1917), 1540 tons, 13 knots, 3 3-in., 150 mines; Itsukushima (Uraga, 1929), 1970 tons, 16 knots, 3000 H.P. (Diesel), 3 5·5-in., 2 3-in. A.A.; Tokiwa, 9240 tons, 21 knots, 2 8-in., 8 6-in., 3 3-in., and 17 smaller vessels, 300—400 tons, about 12 knots. Okinoshima (1936) 4400 tons, 9000 H.P., 20 knots, 4 5·5-in.

MINESWEEPERS.—Nos. 1, 2, 3 (1923), No. 4 (1925), and Nos. 5, 6 (1929), 615 tons, 20 knots, 2 4·7-in., 1 3-in. A.A. Nos. 9, 10 (1918), 770 tons, 24 knots, 2 4·7-in.; Nos. 13—14 (1933), and Nos. 15—16 (Building), 492 tons, 2 4·7-in. guns, and Nos. 17 and 18 are projected.

GUNBOATS.—Saga (1912), 685 tons, 15 knots, 1 4·7 in., 3 3-in. A.A.; Uji (1903), 540 tons, 13 knots, 4 3-in.; Ataka (1922), 725 tons, 16 knots, 2 4·7-in., 2 3-in. A.A.

RIVER GUNBOATS.—Futami (1930), Atami (1929), 170 tons, 16 knots, 1 3-in. gun Katata, Hira, Hodzu, Seta (1923), 305 tons, 16 knots, 2 3-in. A.A.; Toba (1911), 215 tons, 15 knots, 2 3-in.; Fushimi (1906), 150 tons, 14 knots, 2 6-pr.; Sumida (1906), 105 tons, 13 knots, 2 6-pr.; and Kotaka (1930), 50 tons, 15 knots, 5 M.G.

SUBMARINE DEPÔT SHIPS.—Taigei (building at Yokohama), 10,000 tons, 689 feet, 13,000 H.P., 20 knots, 4 5-in. A.A.; Chogei (1924), Jingei (1923), 5160 tons, 16 knots, 4 5·5-in.; Komahashi (1914), 1230 tons, 13·9 knots, 2 3-in, 1 3-in. A.A.; Karasaki (1896), 9750 tons, 13 knots, 1 3-in., 1 3-in. A.A.

ANTI-SUBMARINE NETLAYERS.—Yayeyama (1932), 1135 tons, 4800 H.P. (reciprocating machinery), 20 knots, 2 4·7-in. A.A.; Shirataka (1929), 1324 tons, 16 knots, three 4·7-in. A.A. guns. Tsubane and Kamone (1929), 450 tons, 19 knots, 1 3-in.

SUBMARINE CHASERS.—Two built at Ishikawajima. 300 tons, 3400 H.P., 24 knots, machine guns and depth charges.

REPAIR SHIP AND SUBMARINE SALVAGE SHIP.—Asahi (ex-Battleship, 12,000 tons). Repair Ship—Akashi, building. Salvage Ships. Cable Ships. Transports and other auxiliaries.

ARMED OILER.—Takasaki, 12,000 tons, 19 knots, 4 5-in. guns, building.

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NETHERLANDS.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons.	
cr.	De Ruyter	6550	560	51	16	70,000 P.T. Y.	Rotterdam (Wilton-Fijenoord)	1935	1936	..	3	..	..	..	..	..	7 *5·9-in.*, 4 *4·2-in.* A.A., 4 M., 1 catapult, 2 seaplanes	—	32	..	450
cr.	Java *	6670	509½	52½	18	65,000	Flushing	1921	1925	..	3	..	1	..	4	..	10 *5·9-in.*, 4 *3-in.* A.A., 8 M., 40 mines, 2 seaplanes	—	30	— / 1070	490
,,	Sumatra *						Amsterdam	1920	1926												
a.g.b.	Brinio	540	172¼	28	9¼	1200 Diesel	Amsterdam	1912	1914	..	2 K.S.	¾	..	..	..	..	4 *4·1-in.*, 2 M.	—	14	34 / —	52
,,	Friso							1912	1914												
,,	Gruno							1913	1915												
c.d.s.	Hertog Hendrik §	4371	317	50	19	6282 *t.* Y.	Amsterdam	1902	1903	347,500	6 H.N.S.	2	..	..	10 H.N.S.	3 H.S.	2 *9·4-in.*, 6 *5·9-in.*, 4 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	1 a.w. 2 sub. 18″	16·5 *t*	710 / —	347
,,	Jacob van Heemskerck †‖	4445	321½	50	19	6396 *t.* Y.	Amsterdam	1906	1908	347,500	6–4 H.N.S.	2	..	..	10 H.N.S.	6 H.N.S.	2 *9·4-in.*, 6 *5·9-in.*, 6 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M., 2 seaplanes	—	16·5 *t*	520 / —	351
c.d.s.	Marten Tromp †	4562	330	50	18¾	6405 *t.*	Amsterdam	1904	1906	347,500	6–4 H.N.S.	2	..	..	10 H.N.S.	3 H.S.	2 *9·4-in.*, 4 *5·9-in.*, 8 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	—	16·7 *t*	710 / —	349
,,	De Zeven Provincien †* Not on seagoing list. (employed as training ship)	5644	333	56	20¼	8516 *t.* Y.	Amsterdam	1909	1910	..	6–4 K.S	2	..	..	10 K.S.	4 K.S.	2 *11-in.*, 4 *5·9-in.*, 10 *3-in.*, 1 *9-pr.*, 4 *1-pr.*, 2 M.	—	16·3 *t*	885 / —	409

Ships marked * above are in the East Indies Squadron. † Of little fighting value. § To be replaced in 1935. ‖ To be replaced in 1938.

GUNBOATS.—(Indian Military Marine): Soemba, Flores (1926–7), and Johann Maurits van Nassau (1933), 1457 tons, 15 knots, three 5·9 in., one 3-in. A.A., 2 M.

MINELAYERS.—Nautilus (1930), used for fishery protection, 955 tons, 14 knots, one 3-in., two 1-pr., 2 M.; Douwe Aukes & Van Meerlant (1922), 749 tons, 13·5 knots, three 3-in. A.A., 2 M., 130 mines; Medusa and Hydra (1911), 670 tons, 11·5 knots, three 3-in., one 1-pr., 1 M., 65 mines; a new vessel authorised and eight old vessels. Minelayers attached to Indian Military Marine: Krakatau (1924), 1120 tons, 17 knots, two 3-in A.A., 2 M., 150 mines, 1 catapult, and 1 seaplane; Pro Patria (1923), 605 tons, 11 knots, one 3-in. A.A., 2 M., 80 mines; Prins Van Oranje and Gouden Leeuw (1932), 1206 tons, 15 knots, two 3-in., and 1 aircraft; Rigel (1931), 1400 tons, 12½ knots, 160 mines; Hercules (1910), 188 tons, 10½ knots, and three old vessels.

MINESWEEPERS.—I.–IV., 270–295 tons; (for the Indian Military Marine): A, B, C, D (1930), 187 tons; and one 1600 tons building.

SURVEYING VESSELS.—Eilerts de Haan, Hydrograaf, and in the Indian Military Marine, Van Doorn, Van Gogh, Tydeman, and Willebrord Snellius.

SUBMARINE DEPÔT SHIPS.—Cornelius Drebbel (1915), 787 tons, 170 H.P. (Diesel), 6 knots; and (in Indian Military Marine) Pelikaan (1922), 2600 tons, 1400 H.P. 12 knots, four 2·75 in., 4 M. 4 C.M.B.'s. (Thornycroft 1928).

OLD LIGHT CRUISER Gelderland (1900), 3966 tons, now used as gunnery training ship. OLD GUNBOATS (1877–9): Hefring, 265 tons, Braga, Tyr and Freyr, 275 tons, 7–8 knots.

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NORWAY.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			in.	in.			knots.	tons.	
c.d.s.	Eidsvold Norge	4166	310¼	50½	16½	4500 Y.	Elswick	1900	1901	350,000	6 H.N.S.	2	..	..	6 H.N.S.	6 H.N.S.	2 *8·2-in.* 6 *5·9-in.*, 8 *3-in.*, 6 *3-pr.*	2 (sub.) 18-in	16·5	550 / —	270
„	Harald Haarfagre	3860	304	48½	16½	4500	Elswick	1896	1898	300,000	7 H.S.	2	..	..	8 H.S.	..	2 *8·2-in.*, 6 *3-in-*	3 18-in.	16·5	550 / —	249
„	Tordenskjold*							1897	1899								2 *8·2-in.*, 6 *4·7-in.*, 6 *3-in.*, 2 *3-in.* A.A., 6 M.	2 (sub.) 18-in.			

FISHERY PROTECTION VESSELS: Fridtjof Nansen (1931), 1050 tons, 15 knots, 2000 H.P., two 4-in., two 2-pr.; Heimdal (1892), 660 tons, 12 knots; four 12-pr.; and Michael Sars. MINELAYERS: Fröya (1918), 760 tons, 22 knots, 4 4-in., 100 mines; Glommen and Laugen (1918), 335 tons, 9½ knots, 150 mines; old gunboats, refitted as minelayers, Tyr, Gor, Vidar, Brage, Nor, Vale, and Uller, 230–280 tons, armed with one 4·7-in. and other guns. Olav Trygrason,†† minelayer and training ship, built at Horten, 1600 tons, 21¾ knots, 6000 H.P., 4 4·7-in. and 1 3-in. A.A. guns, and 2 T.T.s. (18 in.), 280 mines. SUBMARINE DEPÔT SHIP, Sarpen, 187 tons, 9 knots, two 9-pr. and one 1-pr.

Four sloops (1400 tons) and six minelayers, 500 tons, are projected, but no money has yet been voted.

* Employed as training ship for Cadets.

†† 1500 H.P. Diesels, 4500 H.P. turbines. Max. speed on Diesels, 14 knots.

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SOVIET UNION.—Battleships.

Class.	NAME.	Normal Displacement.	Length. (Extreme).	Beam.	Draught.	Horse-Power.	Where Built.	Makers of Engines.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.							in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Paris Commune (*ex*-Sevastopol) †																					
b.	October Revolution (*ex*-Gangut)	23,606	594	87	27½	42,000 ‡	Baltic Works	Baltic Works	1911	1915	..	9–5	3	..	..	12–10	6	12 *12-in.*, 16 *4·7 in.*, 4 *3-in.* A.A., *and smaller*	4 (sub.) 18-in.	23	2000 / 1000	113
b.	Marat (*ex*-Petroparlovsk)																					
b.	General Alexieff* (*ex*-Volya)	22,600	551¼	89¾	27	26,500	Nikolaev R.S.B.Co.	..	1914	1917	..	12–4	3–1½	9–8	..	12–8	5	12 *12-in.*, 18 *5-in.*, 4 *2·5-in.* A.A., 4 *3-pr.*, 8 *11-pr.*, 4 M.	4 (sub.) 18-in.	21	2300 / 720	125

* Under French protection at Bizerta. † 1 aircraft. ‡ These ships are being modernised; underwater protection and re-engining.

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SOVIET UNION.—Cruisers.

Class.	NAME.	Normal Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power.	Where built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt. / Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal / Oil	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
cr.	**Admiral Istomin**	7600	..	..	..	..	..	..	Bldg.‡	..	..	..	.. ..	..	..	..	..
,,	**Admiral Kornilov**																
l. cr.	**Aurora** (*ex*-S.S.S.R)	6730	416	55	21	11,600	Petrograd	1900	1903	..	..	..	14 *6-in.*, 5 *6-pr.* A.A., 2 M.	..	20	964 / —	573
,,	**Almaz** *	3300	363	43½	17½	7,500	..	1903	1904	..	— / 3	..	7 *4·7-in.*, 2 M.	..	19	650 / —	300
,,	**Chevonaya-Ukrainia** (*ex*-Ad. Nakhimov)	6934	507	50⅓	18½	50,000	Nikolaev	1915	1923	..	..	..	15 *5·1-in.*, 4 *3-in.*, 8 *3-in.* A.A., 4 M., 100 mines, 2 flying boats	12	29½	540 / 690	600
,,	**Komintern** † (*ex*-Pamyat Merkuriya)	6675	440	54½	20½	19,500	Nikolaev	1903	1907	..	..	..	15 *5·1-in.*, 4 *3-in.*, 4 *6-pr.*, 1 aircraft	2 (sub.)	23	1190 / —	595
,,	**General Kornilov** * (*ex*-Kagal)	6675	439½	54½	20½	19,500	Sevastopol	1902	1905	..	..	..	16 *6-in.*, 2 *11-pr.*	2 (sub.)	23	1100 / —	595
,,	**Krasni Kavkaz** § (*ex*-Ad. Lazarev)	7600	535	51½	19	60,000	Nikolaev	1916	1930	..	3 / 1	3	4 8-*in.*, 4 *3-in.* A.A., 4 *4-in.* A.A., 4 M., 100 mines, 2 seaplanes	(a.w.)	29½	540 / 690	650
,,	**Profintern** (*ex*-Svietlana)	7600	507	50⅓	18½	50,000	Reval	1915	1925	..	3 / 1	3	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 1 aircraft	(a.w.)	29½	540 / 690	..
,,	**Voroshilov** (*ex*-Ad. Grieg)	7600	507¾	50⅓	18½	50,000	..	..	1930	..	..	..	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 1 aircraft	(a.w.)	29½	540 / 690	..

* Under French protection at Bizerta. Disarmed. † Training ship. ‡ Originally designed as sister ships to Krasni Kavkaz, launched in 1914.
§ Krasni Kavkaz has been modernised, and instead of 15 5·1-in. guns, she is now fitted with 4 8-in.

4 sloops, 4 gunboats, 4 river gunboats, 21 minesweepers, 13 despatch vessels, about 50 C.M.B.s (some may be building), some submarine chasers, and miscellaneous other craft.
2 coastguard vessels, 761 tons, 4-in. guns, are building in Italy (Ansaldo, Genoa).

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SPAIN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Side. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	ins.	ins.			knots.	tons.	
b.	Jaime I.	14,224	459¼	78¾	25½	15,500 P.T. Y.	Ferrol	1914	1921	..	8-5 K.S. 2–1	10 (heavy) 3 (sec.)	8 *12-in.*, 20 *4-in.*, 4 *3-pr.*, 4 *3-pr.* A.A., 2 M.	—	20·2 *t*	1850 / 20	854
l. cr.	Canarias	10,000	636	64	17·4	90,000 P.T.(G.) Y.	Ferrol	1931	1934	..	4 / 3	1	8 *8-in.*, 6 *4·7-in.*, 4 *4·7-in.* A.A., 8 *2-pr.* A.A., 2 seaplanes; 1 catapult.	12 21-in. (T.)	33·0	— / 2750	700
,,	Baleares							1932									
,,	Miguel de Cervantes	7475	579½	54	16½	80,000 P.T.(G.) Y.	Ferrol	1928	1930	..	3 / —	..	8 *6-in.*, 4 *4-in.* A.A., 2 *3-pr.*, 1 M.	12 21-in. (T.)	33·0	— / 1680	560
,,	Almirante Cervera							1925	1928								
,,	Libertad (*ex*-Principe Alfonso)							1925	1927								
,,	Republica (*ex*-Reina Victoria Eugenia)	4857	462	50	15¾	25,500 P.T.	Ferrol	1920	1923	..	3–1½ / —	3	9 *6-in.*, 4 *3-pr.* A.A., 1 *3-in.*, 4 M., 1 L.	4 21-in.	25·5	1200 / 230	404
,,	Mendez Nuñez	4509	462	46	14½	45,000	Ferrol	1922	1924	..	3	..	6 *6-in.*, 4 *3-pr.* A.A., 4 M.	12 21-in. (T.)	29	800 / 500	320
g.b.	Eduardo Dato	1335 (normal)	253½	33½	11¼	1700	Ferrol	1923	1925	..	..	..	4 *4-in.*, 2 *3-pr.*, 2 M.	—	15	324 / —	131
,,	Jose Canalejas							1922	1924								
,,	Antonio Canovas del Castillo							1922	1923								
,,	Lauria	800 (normal)	213¾	30	9½	1100 Y	Cartagena	1912	1912	..	..	..	4 *3-in.*, 2 M.	—	14·0	148 / —	121
,,	Laya							1911	1911								
S.C.	Dédalo	11,385	418	55	23	3000	..	..	1922	..	..	..	2 *4·1-in.*, 4 *3-in.*, A.A., 25 seaplanes	—	13	1000 / —	350

Motor-launches, M 1, 2, 4, 5, 6; H 2, 3, 4, 40 tons. Sailing Training ships: Sebastian Elcano (1928), 3500 tons, 800 H.P. (Diesel), 9·5 knots; Galatea (*ex*-Clarastella) (1903), 2500 tons, bought in Italy. Nine armed trawlers (built in Britain). Eight fishery protection vessels. Three C.M.B.s. (*ex*-British).
Submarine salvage vessel Kanguro (1917), 2750 tons, 10 knots, four 2-pr. Tofino, 1200 tons, building at Ferrol.
Three coastguard patrol vessels, 250 tons, authorised; and three fishery protection vessels are projected.
Minelayer Vulcano, 2100 tons (1936) 264 mines.

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SWEDEN.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel Coal. Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
c.d.s.	Aran	3361	287	49¼	16·7	7000 Y. *t*	Gothenburg	1901	1902	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·2 *t*	300 —	287
,,	Drottning-Victoria	6899	396·7	61	21½	22,000 (G.) Y.	Gothenburg	1917	1921	666,000	8–6 K.S.	1½	4 H S.	..	8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 6 *3-in.*, 2 *6-pr.*, 2 M.	—	23·0	690 98	450
a.c.	Fylgia	4060	378	48·6	20·6	12,444 Y. *t*	Stockholm	1905	1907	385,700	4 K.S.	2	..	..	5 K.S.	5 K.S.	8 *5·9-in.*, 10 *6-pr.*, 2 *1-pr.*	2 sub. 18-in.	22·7 *t*	900 —	328
Hangar Cruiser	Gotland	4527	442	50·6	14·7	33,000 (G.)	Gothenburg	1931	1934	910,000 (estimated)	..	..	..	..	..	..	6 *6-in.*, 4 *3-in.* A.A., 4 M., 100 mines, 8 aeroplanes, 1 catapult	6 21-in.	27·0	oil	453
c.d.s.	Gustav V.	6899	396·7	61	21½	22,000 (G.) Y.	Malmö	1918	1922	666,000	8–6 K.S.	1½	4 H.S.	..	8 K.S.	5 K.S.	4 *11-in.* 8 *5·9-in.*, 4 *3-in.* A.A., 2 *6-pr.*, 2 M.	—	23·0	690 98	450
,,	Manligheten	3361	287	49¼	17·4	7400 Y.	Malmö	1903	1904	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·0	300 —	287
,,	Oscar II	4085	313·6	50·5	18	9000 Y.	Gothenburg	1905	1907	..	6 K.S.	2	6 K.S.	6 K.S.	7½ K.S.	5 K.S.	2 *8·3-in.*, 8 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	18·0	500 —	330
,,	Sverige	6899	392·7	61	21½	20,000 tur. Y.	Gothenburg	1915	1917	666,000	8–6 K S.	1½	4 K.S.	..	8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 6 *3-in.*, 2 *6-pr.*, 2 M.	—	22·5	690 98	450
,,	Tapperheten	3361	287	49¼	17·7	6000 Y.	Malmö	1901	1903	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	16·5	300 —	287
,,	Wasa	3361	287	49¼	17	6500 Y.	Stockholm	1901	1902	..	7 K.S.	1⅞	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	17·2	300 —	287

Gustav V. and Sverige have been reconstructed and modernised (1929–33). Drottning-Victoria is also to be reconstructed. Two older coast-defence ships, Oden, Thor (1897, 1899) (reconstructed 1915–16), 3297 tons, 16½ knots, 5500 H.P. 2 10-in., 6 4·7-in., 8 6-pr. guns, to be used as depôt ship for flying-boats. Minelayer Clas Fleming,* 1800 tons, 4 4·7-in., 20 knots, 100 mines; Vedette boats (employed as minesweepers), Sökaren, Sveparen, Sprängeren (1918), and 12 others, to be fitted as minelayers. Jagaren, Kaparen, Snapphanen and Väktaren, 250 tons, 177 ft. long, 27 knots, 2 3-in. Torpedo gunboats, Jacob Bagge, Oernen, Psilander, 738 tons, 2 4·7-in., 1 torpedo tube (15-in.), 20 knots. Gunboat Svensksund (1891), 354 tons. Depôt ship for submarines, Svea (1886), 3300 tons, 4 4·7 in. Aircraft depôt ship Dristigheten (1901), 3620 tons. Depôt Ships:—Niord (1898), 3297 tons; Göta, 3350 tons. Sailing training ships: Af. Chapman, Najaden, Jarramas and Falken (1877–1900).

* Reported to be having Diesels fitted.

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UNITED STATES.—Battleships.

Class.	NAME	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers	Where Built.	Date of Launch.	Date of Completion.	Cost. §	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	**Arizona †**	32,600	608	106¼	27½	33,376 B. & W. P. tur.	New York (Navy Yard)	1915	1916	1,485,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	—	21·0	— / 2322	1400
b.	**Arkansas ***	26,100	562	106	26	30,000 P. tur.	New York (S.B. Co.)	1911	1912	964,000	11–5 K.S.	3	..	8–6 K.S.	11 K.S	6½	12 *12-in.* (50 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	20·5	— / 5100	1430
b.	**California**	32,600	624	97½	30½	28,500 tur. electric drive	Mare Island (Navy Yard)	1919	1921	2,620,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 M., 2 *1-pr.*, 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— / 4656	1412
b.	**Colorado.**	32,500	624	97½	30½	27,300 B. & W. tur. electric drive	New York (S.B. Co.)	1921	1923	1,383,000	13½–12 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— / 4570	1407

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b.	**Idaho ‡** .	. 33,400	624	97⅓	29	32,000 B. & W. P.T.	New York (S.B. Co.)	1917	1919	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 float planes	2 (sub.) 21-in.	21	— / 3271	1374
b.	**Maryland** .	31,500	624	97½	29⅔	27,300 B. & W. tur. (G.) and electric drive	Newport News	1920	1921	1,383,000	13½–12 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— / 4570	1410
b.	**Mississippi ‡** .	33,000	624	97⅓	28½	32,000 B. & W. C.T. (G.)	Newport News	1917	1917	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21	— / 3271	1374

* See note * on p. 239. † See note † on p. 239.
‡ Modernised, 1934. The particulars given above are prior to modernisation. (See ‡, p. 239.)
§ The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

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UNITED STATES.—Battleships—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Belt.	Armour. Deck.	Armour. Side above Belt.	Armour. Bulkhead.	Armour. Gun Position. Heavy Guns.	Armour. Gun Position. Secondary.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. / Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots.	tons.	
b.	Nevada § .	29,000	583	108	27½	25,000 Y. P. tur.	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½–8 K.S	1½–3	..	13½ K.S.	18–16 K.S.	..	10 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 L., 2 catapults, 3 floatplanes	—	20·5	— / 2000	1320
b.	New Mexico ‡	33,400	624	97⅓	28⅓	28,500 B. & W. Electric drive	New York (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— / 3271	1414
b.	New York *	27,000	573	106	26	28,100 B. & W. recip.	New York (Navy Yard)	1912	1914	1,315,114	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	21·0	— / 5200	1450
b.	Oklahoma §	29,000	583	108	28½	25,300 B. & W. recip.	New York (S.B. Co.)	1914	1916	2,200,000	13½–8 K.S.	1½–3	..	13½ K.S.	18–16 K.S.	..	10 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	—	20·5	— / 2000	1320
b.	Pennsylvania †	33,100	608	106¼	28	33,376 B. & W. Cur. tur.	Newport News	1915	1916	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes.	—	21·0	— / 2300	1380
b.	Tennessee .	32,300	624	97½	30¼	26,800 B. & W. Tur. electric drive.	New York (Navy yard)	1919	1920	2,620,000	14–8 K.S.	3	..	..	18 K.S.	..	12 *14-in.* (50 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— / 4656	1412

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b.	Texas*	27,000	573	106	26	28,100 recip.	Newport News	1912	1914	1,166,000	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 16 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., 4 *3-pr.*, 2 *1-pr.*, 2 M., 1 catapult, 3 floatplanes	—	21·0	— / 5200	1450
b.	West Virginia Two battleships of 35,000 tons are to be laid down in 1937.	31,800	624	97½	30	27,300 B. & W. tur. electric drive.	Newport News	1921	1923	1,383,000	13½–1 K.S.	..	..	..	18 K.S.	..	8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., 4 *6-pr.*, 2 *1-pr.*, 2 M., 2 catapults, 3 floatplanes	2 (sub.) 21-in.	21·0	— / 4570	1407

Battleship Utah was converted to a mobile target ship in 1931 in accordance with the London Naval Treaty, and the battleship Wyoming was converted to a training ship (speed 18 knots) in 1931 in accordance with London Naval Treaty.

* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against aerial attack, conversion to oil burning, installation of 3-in. A.A. battery, and addition of catapults. Cost about £600,000 each ship. Displacement increased about 3000 tons.

† Modernised in 1931. Modernisation included fitting bulges, reboilering, increasing elevation of turret guns, replacing former anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control.

‡ Taken in hand for modernisation 1931. New Mexico and Mississippi completed 1933. Idaho completed 1934. Modernisation includes fitting, increased deck protection increasing elevation of turret guns, installation of eight 5-in. A.A. guns, reboilering, fitting of new turbines (the electric drive in New Mexico has been replaced by turbine machinery), alterations to masts and bridges, and fitting of bulges.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery.

The modernisation of California, West Virginia, Colorado, Maryland, and Tennessee is projected.

UNITED STATES.—Aircraft Carriers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Armour. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
A.C.	Wasp	14,700	688 (onw.L.)	80	20	..	Bethlehem S. B. Co.	..	Bldg.	..	..	..	.. ..	..	..	..	..
A.C.	Yorktown	19,900	762 (onw.L.)	83	21¾	120,000	Newport News	..	Bldg. est. 1937	..	..	..	12 5-*in.* A.A. guns.	..	34	..	..
A.C.	Enterprise																
A.C.	Ranger	14,500	727 (onw.L.)	80	19	53,500 (G.)	Newp't News S. B. Co.	1933	1934	about * 4,000,000	..	..	8 5-*in.* A.A., 76 aircraft	..	29¼	Oil	1434
A.C.	Lexington	33,000	880	104	31¼	180,000 tur.electric	Bethlehem S. B. Co. (Fore River)	1925	1927	9,000,000	..	..	8 8-*in.* (55 cal.), 12 5-*in.* (25-cal.) A.A. 4 6-*pr.* Operates about 80 land-planes.	..	33½	7100	1670 *ex* Air
A.C.	Saratoga	33,000	888	106	31	180,000 tur.electric	N.Y. Shipbuilding Co.	1925	1927	9,000,000	..	..		..	33½	7100	
A.C.	Langley †	11,500	542	65½	19	72,000 tur.electric	Mare Island Navy Yard	1912	1922 as aircraft carrier	..	..	..	4 5-*in.* (51 cal.), operates 32 land-planes, 2 catapults.	—	15	— / 2000	411

For particulars of Aircraft Tenders and Repair Ships, see page 242.

* The estimated cost has been increased from 19 million dollars to 21 million dollars to allow for the conversion of the vessel from a "flush-deck" type of carrier to an "island" type of carrier during construction.

† Formerly Collier Jupiter, converted 1921 at Norfolk Navy Yard.

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UNITED STATES.—Cruisers.

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where Built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
Phœnix Class	Phœnix	10,000 estimated	..	..	..	..	N.Y.S. Co., Camden	..	est. 1937	2,395,000	..	..	.. ..	..	..	..	..
	Boise						Newport News	..		2,330,000	..	..	.. ..	..	..	..	..
	Honolulu						N.Y. Navy Yard	..		..	..	..	*6-in.*	..	..	..	..
	St. Louis						Newport News	..	est. 1939								
	Helena						N.Y. Navy Yard	..									
Wichita Class	Wichita	10,000 estimated	..	..	..	..	Philadelphia New York	..	est. 1938	..	..	..	9 *8-in.*, 8 *5-in.* A.A., 2 *3-pr.*, 10 smaller, 2 catapults, 4 aircraft.	None	..	..	..
Brooklyn Class	Savannah	10,000 estimated	600 (onw.L.)	61½	19¾	95,000	N.Y.S. Co., Camden	1936	est. 1937	2,410,000 estimated	..	..	15 *6-in.*	..	32	..	..
	Nashville						N.Y.S. Co., Camden	..									
	Brooklyn						New York Navy Yard										
	Philadelphia						Philadelphia Navy Yard										
Quincy Class	Vincennes	10,000 estimated	575	61¾	19½	107,000	Bethlehem S. B. Corp., Quincy	1937	Bldg est. 1937	2,410,000 estimated	..	..	*8-in.* guns	..	..	..	..
	Quincy							..	Bldg. est. 1936	1,860,000 estimated							

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Astoria Class	Tuscaloosa	10,000 estimated	578 (overall) 573 (on W.L.)	61¾	19½	107,000 (G.)	New York, S. B. Co.	1933	1934	2,090,000 estimated	5/3	..	9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., and 10 smaller, 2 catapults, 4–6 aircraft, 50 mines	None	32½	oil	602
	San Francisco						Mare Island Navy Yard										
	New Orleans						New York Navy Yard			2,460,000							
	Astoria						Puget Sound Navy Yard			2,460,000	5						
	Minneapolis						Philadelphia Navy Yard			2,460,000	6						
Portland Class	Portland	9800	584 (on W.L.)	66	17½	107,000 (G.)	Bethlehem S. B. Co. Quincy	1932	1933	2,210,000			9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., and 10 smaller, 2 catapults, 4–6 aircraft	6 21-in.	32½	oil	602
	Indianapolis	9950					New York S. B. Co.	1931	1932	2,250,000							
Chester Class	Northampton	9050	600	65	16·3–17·6	107,000 P.T. (G.)	Bethlehem S. B. Corp., Quincy	1929	1930	2,180,000	3 — ..	..	9 *8-in.* (55 cal.), 4 *5-in.* (25 cal.) A.A., 2 *3-pr.*, 2 catapults, 4–6 seaplanes	6 21-in. (T)	32½	oil	611
	Chester	9200		65			American Brown Boveri Elec. Corp.	1929	1930	2,230,000							
	Louisville	9050		66			Puget Sound Navy Yard	1930	1931	2,290,000							
Augusta Class	Chicago	9300		68			Mare Island Navy Yard	1930	1931	2,280,000							
	Houston	9050		65			Newport News S. B. & D. D. Co.	1929	1930	2,170,000							
	Augusta	9050		66				1930	1931	2,170,000							
Omaha Class	Cincinnati	7050	555½	55⅓	13½	90,000 P.T. (G.)	Tacoma, Wash.	1921	1924	1,730,000	3 — ..	..	12 *6-in.* (53 cal.) (Cincinnati and Detroit, 10 *6-in.*), 4 *3-in.* (50 cal.) A.A., 2 *3-pr.*, 2 catapults, 2 aircraft	6 21-in. (T)	33·7	— / 1800	450
	Concord						Philadelphia (Cramp)			1,742,000							
	Detroit	7050	555½	55⅓	13½	90,000 C.T. (G.)	Bethlehem S. B. Co. Quincy	1922	1923	1,584,000	3 — ..	..					

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UNITED STATES.—Cruisers—*continued.*

Class.	NAME.	Standard Displacement.	Length. (Extreme.)	Beam.	Draught.	Horse-Power. Type of Machinery and Boilers.	Where built.	Date of Launch.	Date of Completion.	Cost (exclusive of armament).	Armour. Belt. Deck.	Armour. Gun Position.	Armament. Guns.	Armament. Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	Complement.
		tons.	ft.	ft.	ft.					£	in.	in.			knots.	tons.	
Omaha Class	Trenton	7050	555½	55⅓	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1923	1924	1,823,000	3 — ..	..	12 *6-in.* (53 cal.) (Marblehead, 11 *6-in.*), 4 *3-in.* (50 cal.) A.A.; 2 *3-pr.*, 2 catapults, 2 floatplanes	6 21-in. (T.)	33·7	— 1800	450
	Marblehead								1924	1,810,000							
	Memphis							1924	1925	1,838,000							
	Milwaukee						Tacoma, Wash.	1921	1923	1,794,000							
	Omaha	7050	555½	55⅓	13½	90,000 P.T. (G.) (Raleigh) C.T. (G.)	Tacoma, Wash.	1920	1923	1,823,000	3 — ..	..	10 *6-in.* (53 cal.) (Omaha, 12 *6-in.*), 4 *3-in.* (50 cal.) A.A.; 2 *3-pr.*, 2 catapults, 2 floatplanes	6 21-in. (T.)	33·7	— 1800	450
	Raleigh						Bethlehem S.B. Co., Quincy	1923	1924	1,616,000							
	Richmond						Philadelphia (Cramp)	1921	1923	1,742,000							
Pensacola Class	Salt Lake City	9100	585½	64	16	107,000 P.T. (G.)	New York S.B. Co.	1929	1929	3,400,000	3 — ..	..	10 *8-in.* (55 cal.), 4 *5-in.* (25 cal.) A.A., 2 *3-pr.*, 2 catapults, 4 planes	6 21-in. (T.)	32½	— 3000	603
	Pensacola						Navy Yard, New York	1929	1930								

GUNBOATS.—Tulsa (1923), and Asheville (1920), 1270 tons, 12 knots, 3 4-in., 2 3-pr., 3 1-pr.; Sacramento (1914), 1140 tons, 12½ knots, 3 4-in., 2 3-pr., 2 1-pr.; and 6 others, used for training purposes; Charleston, building at Charleston Navy Yard, and Erie, building at New York Navy Yard, 2000 tons, 6-in. guns.

RIVER GUNBOATS.—Guam (1927), Tutuila (1928), 370 tons, 14 knots, 2 3-in., 8 M.; Palos, Monocacy (1914), 180 tons, 13¼ knots, 2 3-in.; Panay, Oahu (1928), 450 tons, 15 knots, 2 3-in.; Luzon, Mindanao (1928), 575 tons, 16 knots, 2 3-in.

MINELAYERS.—Yosmite *ex*-San Francisco (1890), 3700 tons, 19½ knots, 4 5-in., 4 6-pr., 2 3-in. A.A., 300 mines; Baltimore (1889), 3950 tons, 20 knots, 4 5-in., 4 6-pr., 2 3-in. A.A., 2 1-pr., 300 mines; Oglala (1918), 4200 tons, 20 knots, 1 5-in., 2 3-in. A.A., 350 mines; 12 light mine-layers. *ex*-T.B.D.'s., mounting 4 4-inch guns.

MINESWEEPERS.—37 in number, "Bird" class (1918, 1919), 840 tons, 1400 H.P., 14 knots, 2 3-in. A.A. guns authorised but not carried. 6 more are equipped as submarine salvage vessels (Chewink, Falcon, Mallard, Ortolan, Pigeon and Widgeon, built 1914–18, 1210–1270 tons, 14 knots).

AIRCRAFT TENDERS.—Patoka (1919), 16,800 tons, 10·9 knots, 2 5-in.; Heron (minesweeper) (1918), 950 tons, 14 knots, 2 3-in. A.A.; Jason (1913), 19,250 tons, 14·3 knots, 4 4-in., 27 planes. Aroostook (1918) (minelayer), 4950 tons, 20 knots, 1 5-in., 2 3-in. (can carry 350 mines); Argonne (1921), 9005 tons, 15 knots, 4 5-in.

AIRCRAFT REPAIR SHIP.—Wright, 9553 tons, 15 knots, 6000 H.P., 2 5-in., 2 3-in. A.A., 20 planes.

DESTROYER TENDERS.—Dobbin (12,450 tons); Whitney (12,450 tons), and Melville (7150 tons), 16 knots, 8 5-in., 4 3-in.; Altair, Denebola and Rigel, 7,600 tons, 10½ knots, 4 5-in., 4 3-in. A.A.; Black Hawk, 8900 tons, 13 knots, 4 5-in.; Bridgeport, 11,750 tons, 12½ knots, 8 5-in.

SUBMARINE TENDERS.—Holland (1926), 11,570 tons, 16 knots, 8 5-in., 4 3-in. A.A., 2 6-pr.; Bushnell (1915), 2896 tons, 14 knots, 4 5-in.; Canopus (1919), 6615 tons, 13 knots, 2 5-in.; Camden (1900), 7596 tons, 12 knots, 4 4-in.; Beaver (1910), 5320 tons, 16½ knots, 4 5-in.

REPAIR SHIPS.—Medusa (1924), 8089 tons, 16 knots, 4 5-in., 2 3-in. A.A., 2 6-pr.; Vestal, Prometheus (1909), 6378 tons, 16 knots, 4 5-in., 1 3-in. 25 submarine chasers (80 tons), mounting 1 3-in. gun. TRAINING SHIPS.—Wyoming (1912), 26,000 tons, demilitarised; Cheyenne (1902), 2800 tons.

5 Store ships, 6 Cargo ships, 3 Transports, 3 Hospital ships, 25 Patrol vessels (Eagle class, 430 tons, 18 knots, 2 4-in., 1 3-in. A.A.), Craneship; Kearsage (capacity 250 tons), 2 ammunition ships, and other auxiliaries.

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SHIPS OF THE LESSER NAVIES.

Albania.—Four motor launches, Durres, Tirane, Vlone and Siranda (built in Italy, 1928), 40 tons, 14 knots.

Austria.—Patrol vessels: Neretva, Compo (1915), 130 tons, 16 knots; Fogas (1915), 62 tons, 16 knots, and Pozsony (1915), 130 tons, 16 knots. Disarmed and are unserviceable.

Bulgaria.—Under the terms of the naval clauses of the Peace Treaty, Bulgarian warships of all classes, existing or under construction, were surrendered to the Allied and Associated Powers or broken up. All vessels are under the Ministry of Commerce for police and preventive duties; six torpedo boats (100 tons, 28 knots), two minesweepers (ex French), and six motor boats of little value.

China.—Cruisers: Ning Hai (Kobe, 1932) and Ping Hai (Shanghai, 1932), 2500 tons (360 ft. × 39 ft. × 12 ft.), 10,500 H.P., 24 knots, six 5·5-in., eight 3·4 in. and eight machine guns, four 21-in. torpedo tubes in pairs. Carry two seaplanes; Chao Ho and Ying Jui, built by Vickers Armstrong 1912, 2500 tons, 600 H.P., 20 knots, two 6-in., four 4-in., two 3-in., six 3-pr., two 2-pr. A.A. and two 1-pr., two single 18-in. torpedo tubes; Hai Yung, Hai Chen and Hai Chou, built at Stettin 1898, 3000 tons, 7500 H.P., 19 knots, three 6-in., eight 4-in., four 3-prs. and smaller guns, mount one submerged 14-in. bow torpedo tube; Hai Chi (Elswick, 1898), 4300 tons, 17,000 H.P., 24 knots, two 8-in. ten 4·7-in., twelve 3-prs., six machine guns and four small guns, five 18-in. torpedo tubes. Tung Chi (Foochow, 1896), now used as a training cruiser, 1900 tons, 1600 H.P., 10½ knots, two 6-in., five 4-in. and eleven smaller guns. Sloops: Yat Sen (1931), 1650 tons, 4000 H.P., 20 knots, two 6-in., four 3-in. A.A., two 3-pr., four machine guns; Hsien Ning (Shanghai, 1928), 418 tons, 2500 H.P., 17 knots, one 4·7-in., one 4-in., three 6-prs., five machine guns; Yung Chien, Yung Chi (Shanghai, 1915), 870 tons, 1350 H.P., 13 knots, one 4-in., one 3-in., four 3-prs. and three smaller guns. Gunboats: Ming Chun (1930), 560 tons, 2000 H.P., 17 knots, one 4·7-in., one 4-in., one 3-in., and some smaller guns, including four machine guns. Yung Sui (Shanghai, 1930), 700 tons, 4000 H.P., 18 knots, one 6-in., one 4·7-in., three 3-in. A.A., and eight smaller guns; Ming Chen (Shanghai, 1931), 600 tons, 18 knots, one 4·7-in., one 4-in., two 3-in. A.A., and two 6-prs. Old Gunboats: Ta Tung and Tse Chion (1900), 900 tons, 6000 H.P., about 18 knots, two 4·7-in., one 3-in. and smaller guns; Chung Shan and Yung Hsiang (Kobe, 1913), 800 tons, 13½ knots, one 4-in., one 3-in.,; old gunboats Kiang Yuan, Kiang Heng, Kiang Chen, Kiang Li (1907, 500 tons, about

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12 knots, one 4·7-in., one 3-in.; Chu Tung, Chu Yu, Chu Yiu, Chu Chien, Chu Kuan and Chu Tai (Kobe, 1907), 700 tons, 12 knots, two 4·7-in., two 3-in. and some smaller guns. Hai Chao (1916), 1200 tons, 16 knots. Two torpedo boats (1912) of 390 tons, with 3-in. guns and two 18-in. torpedo tubes. Four torpedo boats of about 100 tons built in 1907, three 14-in. torpedo tubes. About twelve patrol boats of 300 tons armed with 6 prs. Forty-two river gunboats. There are in addition a few gunboats and miscellaneous vessels belonging to the water police of Kwang Tung province. Two converted seaplane carriers (two seaplanes). One seaplane carrier, Teuck Shen, building. Four motor torpedo boats built by Thornycroft, 1936, two torpedoes, two machine guns, 45 knots. The new construction programme is reported to include two cruisers, four destroyers and four submarines. China at present has no submarines.

Colombia.—Gunboats: Presidente Mosquera, 200 tons; Cartagena, Santa Marta, Barranquilla (Yarrows, 1930), length 137½ feet, speed 13½ knots, two 3-in. A.A. The following two destroyers were purchased from Portugal early in 1934, Caldas and Antioquia (1934), 1282 tons, length 319 ft., beam 31 ft, speed 36 knots, four 4·7 in. guns, one 1½-in. A A., and eight 21-in. torpedo tubes; built by Yarrow's in Portugal. River gunboats: General Nerino and Esperanza, 400 tons, 15 knots. Motor boats: Cauca (1913), 50 tons, four Guardacostas (Yarrow, 1913), 20 tons. Patrol vessels: Junin, Cairabosso and Pechincha.

Cuba.—Light cruiser, Cuba, 2055 tons, 6000 H.P. 18 knots, two 4-in., six 6-pr., two 3-pr., four 1-pr., 2 M. Training ship: Patria (1911), 1200 tons, 16 knots, two 3-in., four 3-pr. Gunboats: Habana, Pinar del Rio, Villas, Matanzas (1912), 80 tons, 12 knots, one 1-pr.; 24 de Febrero, 10 de Octubre (1911), 218 tons, 12 knots, three 3-pr.; Baire (1906), 500 tons, 14 knots, four 3-in., two 3-pr., 1 M.; Yara (1895), 450 tons, 12 knots, two 6-pr.; 20 de Mayo (1895), 200 tons, 12 knots, two 3-pr., two 1-pr.; Enrique Villuendas (1899), 178 tons, 16 knots, two 3-pr.: Captain Quevedo (1932), 137 tons, 12 knots, two 1-pr., one 3-in. A.A., and General Zagas, 500 tons, two 1-pr. One patrol boat building at Havana, 115 tons, 3 guns. The new construction programme is reported to include two small cruisers and a number of gunboats.

Czecho-Slovakia.—There are two river gunboats carrying two 3-in. guns for training purposes and four small minelayers.

Ecuador.—Mine-laying patrol vessels Tarqui (50 tons), and gunboat Cotopaxi (1884), 700 tons.

Estonia.—Mine-layers Keri and Vaindlo, minesweepers Sourop and Ristna, two ice-breakers, and Peipus Lake gunboats Ahti and Tartu. Torpedo boat Sulev (*ex*-German A 32) (1917), 243 tons, 26 knots, two 3-in., 2 torpedo tubes; gunboat Laene, river gunboat Mardus. Two submarines, Lembit and Kalev, built at Vickers'

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1936, 600 tons surface displacement, 820 tons submerged, 1200 H.P., 13½ knots on surface, 8½ knots submerged, one 40-mm. A.A. gun, four 21-in. torpedo tubes. Six C.M.B.'s are contemplated.

Finland.—Patrol boats Klas Horn (1892) (*ex*-Posadnik), Uusimaa (1919), Hämeenmaa (1918), Matti Kurki (1892) (*ex*-Voevoda), Karjala (1918) (*ex*-Filin), and Turunmaa (1918) (*ex*-Orlan); 7 C.M.B.'S; 6 ice-breakers, a minelayer (150 mines), 640 tons, and three mine-sweepers, and 21 motor launches. Two armoured gunboats (4-in. belt), Väinämöinen and Ilmarinen, length 305 feet, 4000 tons, 4000 H.P. (Diesel-electric), 15 knots, four 10-in. guns, eight 4·7-in guns, built at A/B Maskin and Brobyggnads, Abo (1932–3). Submarines Iku-Turso, Vetehinen and Vesihiisi (Abo, 1930), 490/700 tons, speed 15 knots surface, 9 knots submerged, one 3-in. gun, 20 mines; Saukko (Helsingfors, 1930), 100/136 tons, two 18-in. torpedo tubes, 9 mines; Vesikko (1933), 250/300 tons, 13/7 knots, four 21-in. torpedo tubes, one machine gun. Sailing training-ship Suomen Joutsen (*ex*-German Oldenburg). An ice-breaker and submarine depôt ship is projected.

Hayti.—Special service vessels, Nord Alexis (1891), 1230 tons, two 4·7-in.; Veretieres (1889), 270 tons; 17 Decembre, 851 tons; Pacifique, 488 tons.

Hungary.—Patrol vessels: Sopron, Debreczen, 138 tons, two 3-in., 4 M.; Kecskemet, Szeged and Gyor, 131 tons, four 3-in., 4 M.; Birago, 59 tons, one 3-in., 4 M.; also 12 motor launches.

Latvia.—Gunboat Virsaitis (*ex*-German M68), 480 tons, two 3-in., two 6-pr., one 3-in. A.A., one torpedo tube; 1 ice-breaker, Krisjanis Valdemars; 2 submarines (1927), Ronis and Spidola, $\frac{390}{514}$ tons $\frac{\text{surface}}{\text{submerged}}$ displ., $\frac{14\frac{1}{2}}{9\frac{1}{4}}$ knots, one 3-in. A.A., 2 M., 6 18-in. torpedo tubes; 2 mine-sweepers, Imanta, Viesturs, 225 tons, 14 knots, one 3-in. A.A., 4 M., 30 mines, completed in 1926; one submarine depot ship, Varonis, formerly an ice breaker; Surveying vessel, Hidrografs.

Manchukuo.—Gunboats Ting Pien, Chin Jen, Shun Tien and Yang Min, built by Harima Dock Co., Japan, 1934–35, 280 tons, 12 knots, 4·5-in. A.A. and A.A. machine-guns; gunboat Haifeng, 200 tons, 13 knots, and another similar. The following have been built recently by the Kawasaki Works at Harbin:—Tatung and Limin, 65 tons, 12 knots, 3 guns, Wenmin, Huimin, Pumin, Onmin, Keimin and Fumin, 15 tons, 10 knots, 3 machine guns. The following vessels were launched at the beginning of 1933 at Yokohama, Daichi Kaihen and Daini Kaihen, 15 knots, 3 machine guns, and the river gunboats Daido and Rinni, 56 tons, 13 knots, one 6-in. gun. Coastguard ships Kaiho, Kaisui, Katei, and Kaikwa, 45 tons.

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Mexico.—Coast defence vessel Anahuac (1898), 3162 tons, 15 knots, two 9·4-in., four 4·7-in., four 6-pr., 2 M., 2 L.; gun-vessels, Tampico and Vera Cruz (Elizabeth Port, New Jersey, 1903); displacement, 980 tons; armament, two 4-in. Q.F., four 6-pr.; 16 knots; fitted to serve as transports for 200 troops, Bravo 1200 tons; 2,600 I.H.P.; 17 knots (Leghorn, 1904), two 4-in., four 6-pr.; and Aguas Prieta, 1200 tons; 1800 I.H.P.; 15 knots, two 4-in., two 6-pr. Two revenue cutters (*ex*-U.S. submarine chasers), 80 tons, 18 knots, 3-in. guns. Four patrol boats, 276 tons, one 6-pr., 9 knots. Ten coastguard vessels built in Spain, 1935, 130 tons, 26 knots, one-6pr., two machine guns, two 1-in. machine guns, two ·5-in. machine guns. Two armed transports, Zocateca and Durango, built in Spain, 1935, 1600 tons, 20 knots, 3000 miles endurance at 15 knots, two 4-in., two twin 1-in. pompoms, two four-barrelled ·5-in. machine guns, built to carry 500 men and 80 horses. Two others, Queratarо and Guanajato, 1300 tons, 20 knots, three 4-in. and twelve machine guns, to transport 230 men and 20 horses.

Paraguay.—Gunboats: Humayta and Paraguay (1931), 636 tons, 17 knots, four 4·7-inch, four 3-inch A.A. guns, six mines; two older, Capitan Cabral and Tacuari, 120 tons, completed 1910, two 3-in., two 6 prs., 10 knots. Two despatch vessels, with 3-in. guns and two vedettes.

Persia.—Gunboats: Babr and Palang (Italy, 1932), 950 tons, 205 feet long, 1900 H.P. (Diesel), 15 knots, two 4-in. and two 3-in. A.A. guns. Four motor patrol boats built in Italy (1932). Semorg, Chahbaaz, Karkas and Sharock, 330 tons, 900 H.P. (Diesel), 15 knots, two 3-in guns. Also several old small gunboats and motor dhows. Gunboats and patrol vessels are for customs work.

Peru.—Almirante Grau and Coronel Bolognesi, cruisers 3200 tons; (Barrow, 1906); two 6-in., eight 3-in., eight maxim; 2 submerged torpedo tubes; 24 knots; converted to oil-burning 1925, to be fitted as minelayers; also Lima (1880, refitted 1920) (parent ship for submarines), 1790 tons, 10 knots, four 4-in. Gunboat America, 200 tons, 14 knots. Destroyer, Rodriguez, 500 tons, 28 knots. T.B.D.s Lennuk (1917), 1400 tons, 35 knots, five 4-in. guns, one 2-pr., nine T.T., eighty mines, and Vambola (1918), 1260 tons, 35 knots, four 4-in. guns, two M., one 2-pr., nine T.T., eighty mines, have recently been purchased from Esthonia, and have been renamed Almirante Guise and Almirante Villar respectively Submarines R1–4, built in U.S.A. (1926–9), and R5 and R6 authorised, $\frac{576}{682}$ tons, $\frac{14\frac{1}{2}}{10}$ knots, one 3-in., 4 torpedo tubes. One vedette boat, the Napo, 98 tons, built by Yarrow, 1921, three 1·8-in. Two destroyers are projected. Two river gunboats of 250 tons are building at New Jersey, for service on the Amazon.

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Poland.—Five *ex*-German torpedo boats (355 tons, 20 knots, two 3-in., 18-in. torpedos) for police purposes. Gunboats Komendant Pilsudski and General Haller, 350 tons, 14 knots, built in Finland (1920). Training ship Iskra. Monitors Warszawa, Horodyszcze, Krakow, Wilno, Torun, Pinsk. Twenty motor boats. Two destroyers, Burza, Wicher, completed 1931–2 at Chantiers Navals Français, 1515 tons, 33,000 H.P., 33 knots, four 5·1-in., one 2·9-in. A.A., 6 torpedo tubes. Three submarine minelayers built in France, Rys, Zbik, and Wilk, completed 1931–2; $\frac{964}{1230}$ tons, $\frac{1800}{1200}$ H.P., 14 knots surface, 9 knots submerged; one 4-in., one 2-pr., 6 torpedo tubes, 40 mines. Minesweepers Jas Kolka, Mewa, Czajka, Rybitwa (1935), 350 tons, 1040 H.P. (Diesels), 15 knots, one 3-in. gun. A minelayer to carry 300 mines, Gryf, 2200 tons, 6000 H.P. (I.C.), 20 knots, six 4·7-in., two 3·5 in. A.A., two machine guns, is building in France. Two destroyers, building by Messrs. J. G. White, of Cowes, launched 1936, 2000 tons, 39 knots, seven 4·7-in., 2 triple torpedo tubes. Two submarine minelayers building in Holland.

Portugal.—The minelayer Vulcano (151 tons) (Thornycroft, 1909). Two sloops, about 1200 tons, sold out of the British Navy, Carvalho Araujo (*ex*-Jonquil) and Republica (*ex*-Gladiolus), two 4-in., two 3-in. A.A. Destroyers Tamega, Guadiana (1913–24), 700 tons, 11,000 H.P., 27 knots, one 4-in., two 3-in., two torpedo tubes. Gunboats Damao and Zaire (1919), Diu and Lagos (1932), 400 tons, 700 H.P., 13 knots, two 3-in., two 3-pr., and there are 18 older ones.

1st class sloops: Alfonso de Albuquerque and Bartolomeu Diaz (Hawthorn Leslie, 1935), 1760 tons, 21 knots, four 4·7 in., two 3-in. A.A., four pom poms, two torpedo tubes, one catapult, and 40 mines. 2nd class sloops: Goncalo Velho and Goncalves Zarco (Hawthorn Leslie, Newcastle, 1933), 1045 tons, 2000 H.P., 17 knots, three 4·7-in., two 1·5-in. A.A. Pedro Nunes, completed 1933, and Infante Henrique (building at Lisbon), 1080 tons, 17 knots, two 4·7-in. Destroyers: Vouga and Lima (Yarrow's, Scotstoun, 1933), and Dao and Tejo (built by Yarrow's in Portugal, 1935), 1380 tons, 33,000 H.P., 36 knots, four 4·7-in., three 1·5-in. A.A., two quadruple 21-in. torpedo tubes, 22 mines. Submarines: Delfin, Espardate, and Golfinho (Vickers, 1934–1935); surface condition, 800 tons, 2300 H.P. and 16½ knots; submerged condition, 1000 tons, 1000 H.P. and 9¼ knots; one 4-in. gun, six 21-in. torpedo tubes.

Two destroyers, Douro and Tejo, sister vessels to Dao, were bought by the Colombian Government and renamed Antoquia and Caldas (see Colombia), and replace vessels were built by the Society of Constructions and by Naval Repairs Co., Lisbon; engines, boilers and all material supplied by Yarrows.

Other ships, including two light cruisers and an aircraft tender are projected.

Rumania.—*River Monitors.*—Bucovina (1916), 540 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Ardeal (1905), 440

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tons, 10 knots, two 4·7-in., one 3-pr., one 3·5-in. A.A.; Basarabia (1915), 530 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Lascar Catargiu, Ioan Bratianu, Milhail Kogalniceanu, Alexandru Lahovari (1907–08), 670 tons, 13 knots, three 4·7-in., two 3-pr., one 3-in. A.A., 2 M.

Flotilla Leaders.—Regele Ferdinand and Regina Maria (Naples, 1930, Thornycroft's design), 1785 tons, 38 knots; length 334¾ ft., five 4·7-in., three 2-pr. A.A.; two twin torpedo tubes. Marasti, Marasesti (*ex*-Italian Nibbio, Sparviero), 1917–18, 1460 tons, 35 knots, five 4·7-in., four 3-in. A.A., 2 M., 2 twin torpedo tubes, 50 mines.

Four vedettes (built in 1908), 50 tons, 18 knots, one 3-pdr. gun.

Gunboats.—Stihi, Lepri Remus, Dumitrescu, Ghiculescu (1916–17, *ex*-French Magnonne, Friponne, Chiffonne, Impatiente), 350 tons, 15 knots, two 3·9-in., 2 M.

Submarine.—Delphin (Quarnaro, Fiume, 1932). Displacement, 640 tons surface, 817 tons submerged; speed 14 knots surface, 9·5 knots submerged, one 4·2-in. gun, 6 torpedo tubes. This vessel, laid down in 1927, has not yet been taken over by Roumania.

There are also five armed motor boats, police craft (*ex*-Austrian T.B.s) Naluca, Sborul, and Zmeul, and seven armed launches.

A submarine depôt ship, Constanta, 1821 tons, two 4-in. A.A. guns (Fiume 1930).

Training ship, Nircea, 350 tons, 8·5 knots, two 1-pr. Sailing with auxiliary engines.

Siam.—*Gunboats:* Ratnakosindr (1925), 920 tons, two 6-in., four 3-in. H.A., 12 knots; Bali and Sugrib (1900), 580 tons, 11·5 knots, one 4·7-in., five 6-pr., 2 M.; Sukhodaya (Vickers, 1930), 1030 tons, 13 knots, two 6-in., four 3-in. A.A. Two 380-ton, 27-knot destroyers, built at Kobe, Sua Gamron Sindhu and Sua Tayanchor. Phra Ruan (*ex*-British Radiant, 1917), 719 tons, 35 knots, three 4-in. Four torpedo boats (built in Japan, 1908–13), 90 tons, 22 knots, one 6-pr., one 3-pr. Six 55-ft. Thornycroft C.M.B.s. Two torpedo boats built in Italy, 1936 (460 tons), 32 knots, three 3-in. guns. Nine more are building in Italy. Training ship Chao Phra (1919), 840 tons, 16 knots. Four 370-ton submarines are building in Japan.

Turkey.—The old battleship Torghud Reis (*ex*-German Weissenburg, 1891), refitted 1927, 9842 tons, 17 knots, six 11-in., three 3-in., two 2·5-in. A.A., 2 submerged torpedo tubes. The battle-cruiser Yavouz Sultan Selim (1912) (*ex*-Goeben), 22,734 tons, 27 knots. Armament: ten 11-in., ten 5·9-in., eight 3·5-in., four 1·5-in. P.P., 2 M., 1 L., 4 submerged torpedo tubes. Light cruisers: Hamidieh (Elswick, 1904), 3830 tons, speed 22 knots; armament: two 5·9-in., six 3-in., eight 3-in. A.A., two 18-in. torpedo tubes; Medjidieh (Philadelphia, 1903), refitted 1927, 3300 tons, speed 22 knots, armament: four 5·1-in., two 3-in. A.A., 4 M. Destroyers: Adatepe, Kocatepe (Ansaldo, Italy, 1932), 1310 tons, 43 knots, four 4·7-in., three 2-pr. A.A. guns, six 21-in. tubes. Tinaztepe and Zafer

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(Cantiere Navale del Tirreno, Italy, 1932), 1840 tons, 38 knots, four 4·7-in. guns, three 2-pr. A.A., six 21-in. tubes. Submarines Ikindji-in-Uni and Birindjiin-Uni (Fijenoord, Rotterdam, 1928), $\frac{433}{556}$ tons, $\frac{13\frac{3}{4}}{9\frac{3}{4}}$ knots, one 3-in., 1 M., six 18-in. torpedo tubes. Dumlupinar (minelayer), (Monfalcone, 1932), 950 tons, 15 knots, 2400 H.P. surface, 1200 tons, 9½ knots, 1400 H.P. submerged, one 4-in. A.A., 4 torpedo tubes, 40 mines. Sakarya (Montfalcone, 1932), $\frac{935}{1220}$ tons, 15 knots 1500 H.P. surface, 925 tons, 9 knots, 1100 H.P. submerged, one 4-in, six 21-in. torpedo tubes. Seven motor launches. Reported that tenders are to be invited for two 8,000-ton cruisers to be built in Japan, four destroyers, and four 600-ton coastal submarines to be built at Rotterdam.

Uruguay.—Torpedo-gunboat (training ship) Uruguay (1910), 1150 tons; two 4·7-in., four 3-in.; two 18-in. torpedo tubes. Surveying ship Capitan Miranda (1930), 540 tons. Gunboat Rio Branco. Training ship, 18 de Julio, 680 tons, 12 knots. Three coastguard patrols boats, Paysandu, Salto, and Rio Negro, built in Italy, 1935, 160 tons, 1150 H.P. (Diesel), 17 knots, two 3-in., two machine guns.

Venezuela.—Old gunboats Mariscal Sucre (1125 tons), two 4-in., two 6-pr. General Salom (750 tons), one 3-in., four 6-pr., 12 knots. Miranda (200 tons), Brion (150 tons). Armed tug José Felix Ribas, two 6-pr. Armed yacht Maracay.

Yugoslavia.—Submarines Hrabri and Nebojsca, completed at Armstrong's 1928, displacement 870 tons surface, 1146 tons submerged; speed 15 knots surface, 10 knots submerged; mount two 4-in., six 21-in. torpedo tubes. Smeli and Osvetnik, completed at Nantes, 1929; displacement 570 tons surface, 797 tons submerged, speed 14·5 knots surface, 9·25 knots submerged, carry one 4-in., one 2-pr., and 6 torpedo tubes (21-in.). Two coastal motor boats, 38 knots, built at Thornycroft's, completed in 1927. Old cruiser Dalmacija (*ex*-German Niobe), refitted 1926, 2600 tons, six 3-in., is used as a gunnery and general training ship. There are four *ex*-Austrian river monitors, Vardar, Drava, Sava, Morava, 400–530 tons, mounting two 4·7-in. and smaller guns; eight *ex*-Austrian T.B.'s; two patrol boats; six mine-layers (*ex*-German, 1918), 330–512 tons, 15 knots, two 3·9-in., 40 mines; six mine-sweepers; one seaplane depôt ship, Zmaj (built at Hamburg, 1929), 1870 tons; one training ship; two submarine depôt ships (1895), and auxiliary craft.

One flotilla leader, Dubrovnik, built at Yarrow's, Scotstoun, completed 1932, length 371 feet, displacement 1880 tons, 42,000 S.H.P., speed 37 knots, carries four 5·5-in., 2 twin 2-pr., 2 triple 21-in. torpedo tubes, and 40 mines.

Three destroyers of 1200 tons building at Adria, turbines being built by Yarrow's.

Several guard vessels are building at Lürsoen, in Germany.

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BRITISH AND FOREIGN FLOTILLAS.

Great Britain.

Name or Number.	Built by.	Completed.	Dimensions. Length (Extreme).	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			FLOTILLA LEADERS.									
			ft. ins.	ft. ins	ft. ins.		Tons.		Knots.			
Tribal Class:												
Ashanti	Denny	Bldg.	..	..	..	..	1850	..	..	..	..	..
Bedouin												
Eskimo	Vickers, Walker ..											
Mashona.. ..												
Matabele ..	Scotts											
Punjabi . ..												
Sikh	Stephen ..											
Somali	Swan Hunter ..											
Tartar												
Afridi	Vickers-Armstrongs	Bldg.	..	..	..	..	1850	..	..	4·7-in. guns.	..	..
Cossack												
Ghurka	Fairfields											
Maori												
Mohawk	Thornycroft											
Nubian												
Zulu	Stephen & Sons											
Jervis	—	Bldg.	..	..	..	..	..	..	..	..	..	..
Inglefield	Cammell Laird	Bldg.	..	..	..	..	1455	38,000	36	5 4·7-in. 2 ·5-in. M. 5 smaller.	2 Q. 21″	..
Hardy		1937										
Grenville	Yarrow	1936	330	34 6	8 0	..	1460					
Faulknor ..	Yarrow ..	Bldg. 1934	343	33 9	8 8	2	1475	38,000	36			
Exmouth ..	Portsmouth Dockyard											
Duncan	Portsmouth Dockyard	1933	329	33 0	8 8	2	1400	36,000	35½	4 4·7-in. 1 3-in. A.A. 2 2-pr., 1 M., 4 L.	2 Q.	.
Kempenfelt ..	J. S. White	1932	329	33 0	8 7	..	1390	36,000	35½			
Keith	Vickers	1931	323	32 3	8 6	2	1400	34,000	35	4 4·7 in., 2 2-prs. 1 M., 4 L.	2 Q	..
Codrington.. ..	Swan Hunter ..	1930	343	33 9	10 0	2	1540	39,000	35	5 4·7-in., 2 2-prs., 1 M., 4 L.	2 Q 21″	..
Wallace	Thornycroft ..	1919	329	31 11	12 4	2	1480	40,000	36	5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L.	2 T. 21″	182
Keppel	,, ..	1925										
Broke, *ex*-Rooke	,, ..	1925										
Bruce	Cammell Laird ..	1918	332 6	31 9	12 3	2	1530	40,000	36·5	5 4·7-in. 1 3-in. A.A. 2 2-pr. A.A. 1 M., 4 L.	2 T 21″	182
Douglas'		1918										
Campbell		1918										
Mackay, *ex*-Claverhouse ..		1918										
Malcolm		1919										
Montrose	Hawthorn Leslie	1919										

DESTROYERS.

Name or Number.	Built by.	Completed.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
Javelin, Intrepid, Hero, Greyhound, Fearless, Eclipse, Defender, Crusader, Beagle, and Acasta Classes:			Feet.	ft. ins	ft. ins.		Tons.		Knots.			
Jackal	..	Bldg.	..	..	..	..	..	..	..	..	..	..
Jaguar	..											
Jamaica	..											
Janus	..											
Javelin	..											
Jersey	..											
Jubilant	..											
Jupiter	..											
Icarus	J. Brown ..	Bldg.	323	33	..	..	1350	31,000	..	4 4·7-in guns 7 smaller	10 21″	..
Ilex												
Isis	Yarrow ..											
Ivanhoe ..												
Imogen ..	Hawthorn Leslie											
Imperial ..												
Intrepid ..	J. S. White											
Impulsive ..												
Hero.. ..	Vickers (Parsons)											
Hereward ..												
Hostile ..	Scotts ..	1936	323	33 0	8 6	2	1350	34,000	35½	4 4·7 in. 7 smaller	2 Q. 21″	..
Hotspur ..												
Hasty ..	Denny ..											
Havock ..												
Hunter ..	Swan Hunter											
Hyperion ..												

Torpedo tubes: T. = triple Q. = quadruple.

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Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions. Length (extreme).	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.			
Javelin, etc., Classes —continued.												
Greyhound ..	Vickers-Armstrong											
Griffin ..												
Garland ..	Fairfields											
Gipsy ..												
Gallant ..	Stephen & Sons	1936	323	33 3	8 6	2	1350	34,000	35½	4·7-in. 2 ·5-in. M. 5 smaller	2 Q. 21″	..
Grenade ..												
Grafton ..	Thornycroft											
Glowworm ..												
Fearless ..	Cammell Laird	..	..	.	..	..	1375					
Foresight ..												
Foxhound ..	Brown											
Fortune .												
Forester ..	J. S. White	1935	329	33 3	8 6	2	1350	36,000	35½	4 4·7-in. 2 ·5-in. M. 5 smaller.	2 Q. 21″	..
Fury . ..												
Fame ..	Parsons/Vickers-Armstrong											
Firedrake ..												
Eclipse	Denny ..											
Echo												
Escapade ..	Scotts ..											
Escort ..												
Electra ..	Hawthorn Leslie	1934	329	33 3	8 6	2	1375	36,000	35½	4 4·7-in. 2 ·5-in. M. G. 5 smaller.	2 Q. 21″	..
Encounter ..												
Esk	Swan Hunter											
Express ..												
Defender	Vickers-Armstrong											
Diamond ..												
Daring ..	Thornycroft											
Decoy ..		1932—1933	317¾ (b.p.)	33	8 6	2	1375	35,000	35½	4 4·7-in. 1 3-in. A.A. 7 smaller	2 Q. 21″	..
Dainty ..	Fairfield ..											
Delight ..												
Diana ..	Palmers ..											
Duchess ..												
Crusader ..	Portsmouth Dockyard	1932	317¾ (b.p.)	33	8 6	2	1375	36,000	35½	4 4.7-in. 1 3-in. A.A. 2 2-pr., 1 M., 4 L.	2 Q. 21″	..
*Comet ..												
Basilisk	Brown ..											
Beagle	,, ..											
Blanche	Hawthorn, Leslie											
Boadicea	,, ,,											
Boreas	Palmers ..	1931	323	32¼	8½	2	1360	34,000	35	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 Q. 21″	140
Brazen	,, ..											
Brilliant	Swan, Hunter											
Bulldog	,, ,,											
Acasta	Brown ..	1930										
Achates	Brown ..	1930										
Acheron	Thornycroft	1931										
Active	Hawthorn Leslie	1930	323	32¼	8½	2	1350	34,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 Q. 21″	140
Antelope	Hawthorn Leslie	1930										
Anthony	Scotts ..	1930										
Ardent	Scotts ..	1930										
Arrow	Vickers-Armstr.	1930										
Thornycroft Type:												
Amazon	Thornycroft ..	1927	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr. 1 M., 4 L.	2 T. 21″	140
Yarrow Type:												
Ambuscade.. ..	Yarrow	1927	322	31	8½	2	1170	33,000	37		2 T. 21″	140
Admiralty "S" Class:												
Sabre..	Stephen	1918										
Shamrock	Doxford	1919										
Saladin	Stephen	1919										
Sardonyx	,, ...	1919										
Scimitar	Brown	1918										
Searcher	,, ...	1918										
Tenedos	Haw. Leslie ..	1919	276	26¾	10⅝	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21″	103
Thanet	,, ...	1919										
Thracian	,, ...	1922										
Stronghold	Scott	1919										
Sturdy	,, ...	1919										
Scout	Brown	1918										
Scotsman	,, ...	1918										
Shikari	Doxford / Chatham ..	1924										

* For Crescent and Cygnet, see under Royal Canadian Navy, p. 211. Torpedo tubes: D = double. T. = triple. Q. = quadruple.

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Great Britain—*continued.*

Name or Number.	Built by.	Completed.	Dimensions. Length (Extreme)	Beam.	Draught.	Number of Screws.	Standards Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).
			Feet.	Feet.	Feet.		Tons.		Knots.			
DESTROYERS— *Admiralty "V" Class:*												
Vansittart	Beardmore ..	1919										
Venomous	Brown	1919										
Verity	,, ...	1919										
Volunteer	Denny	1919	312	29½	10⅝	2	1120	27,000	34	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130
Veteran	Brown	1919										
Wanderer	Fairfield ..	1919										
Wren	Yarrow.. ..	1923										
Whitshed	Swan Hunter ..	1919										
Wild Swan	,, ,, ..	1919										
Witherington ..	J. S. White ..	1919										
Wivern	,, ,, ..	1919	312	29½	10⅝	2	1120	27,000	34			
Wolverine	,, ,, ..	1920										
Worcester	,, ,, ..	1922										
Whitehall	Swan Hunter / Chatham	1925										
Walpole	Doxford ..	1918										
Whitley	,, ..	1918										
Wryneck	Palmer ..	1918	312	29½	10⅞	2	1100	27,000	34	4 4in., 1 2-pr., 1 M., 4 L.	2 T.	120
Windsor	Scott	1918										
Wrestler	Swan Hunter ..	1918										
Wessex	Haw. Leslie ..	1918										
Winchester ..	J. S. White ..	1918	312	29½	10·7	2	1100	27,000	34			
Wolfhound	Fairfield ..	1918										
Westminster ..	Scott	1918										
Westcott	Denny	1918										
Wakeful	Brown	1917										
Walker	Denny	1918										
Walrus	Fairfield ..	1918	312	29½	10·7	2	1100	27,000	34			
Warwick	Haw. Leslie ..	1918										
Watchman	Brown	1918								4 4-in., 1 2-pr., 1 M., 4 L.	2 T. 21"	120
Whirlwind	Swan, Hunter..	1918										
Winchelsea	J. S. White ..	1918										
Vanessa	Beardmore ..	1918										
Vanity	,, ..	1918										
Vidette	Stephen ..	1918										
Vivien	Yarrow ..	1918										
Valentine	C. Laird ..	1917										
Valorous	Denny	1917								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120
Vimy (*late* Vancouver)	Beardmore ..	1918								4 4-in., 1 2-pr., 1 M., 4 L.	1 T. 1 D.	
Vanoc	Brown	1917								4 4-in., 1 2-pr., 1 M., 4 L.	3	
Vanquisher ..	,, ...	1917	312	29½	10⅝	2	1090	27,000	34			
Vega	Doxford ..	1917									2 T.	
Velox	,, ..	1918								4 4-in., 1 2-pr., 1 M., 4 L.	1 T., 1 D.	
Venetia	Fairfield ..	1917									2 T.	
Verdun	Haw. Leslie ..	1917										
Versatile	.. ..	1918									1 T., 1 D.	120
Vesper	Stephen ..	1918	..	..	..	..	..	..	..			
Vimiera	Swan Hunter ..	1917								4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	
Violent	,, ,, ...	1917										
Vivacious	Yarrow ..	1917									1 T. 1 D.	
Vortigern	J. S. White ..	1918										
Thornycroft "V" Class:												
Witch	Thornycroft / Devonport	1924	312	30¾	10·9	2	1140	30,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130
Wishart	Thornycroft ..	1920										
Woolston	,,											
Wolsey	,,											
Viceroy	,,	1918	312	30¾	10¼	2	1120	30,000	35	4 4-in., 1 2-pr., 1 M., 4 L.	2 T.	120
Viscount	,,											
Admiralty "R" Class:												
Tempest	Fairfield ..	1917										
Thruster	Haw. Leslie ..	1917										
Torrid	Swan Hunter ..	1917										
Skate	Brown	1917	276–276½	26¾	10⅞	2	900	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21"	98
Rowena	,, ...	1916										
Restless	,, ...	1916										
Sable	H. & Wolff ..	1916										
Yarrow "R" Class:												
Tyrant	Yarrow ..	1917	271½	25¾	9½	2	760	23,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21"	98

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Great Britain—*continued.*

SUBMARINES.

Name or Number.	Where Built.	Completed.	Dimensions. Length (Extreme)	Beam.	Draught.	No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).
			Feet.	Feet.	Feet.		Tons.		Knots.			
Unity Class:												
Undine ..	Vickers ..	Bldg.	..	..	..	..	..	..	..	..	..	..
Unity												
Ursula ..												
Triton Class:												
Triton	Vickers-Armstrong	Bldg.	..	..	..	..	..	..	..	..	..	..
Thetis.. ..	Cammell Laird	Bldg.	..	..	..	..	..	..	..	..	..	..
Triumph ..												
Trident ..												
Tribune ..												
Thames Class:												
Thames ..	Vickers-Armstrong	1932	345	28	13·5	..	1,805 / 2,680	10,000 / 2,500	21¾ / 10	1 4-in., 2 smaller	6	..
Severn ..	Vickers-Armstrong	1935	345	28	13·7	..	1,850 / 2,710	10,000 / 2,500	22¼ / 10		..	..
Clyde												
Porpoise Class:*												
Porpoise ..	Vickers-Armstrong	1933	289	29·8	13·8	..	1,500 / 2,060	3,300 / 1,630	15 / 8¾	1 4-in., 2 smaller	6	..
Grampus ..	Chatham ..	Bldg.										
Narwhal ..	Vickers ..	1935	..	..	..	..	..	..	..	..	..	..
Rorqual ..												
Cachalot ..	Scott's ..	Bldg.										
Seal	Chatham ..											
Swordfish Class:												
Starfish ..	Chatham ..	1933	202·5	24	10·5	..	640 / 935	1,550 / 1,300	13¾ / 10	1 3-in., 1 smaller	6	..
Seahorse ..												
Swordfish ..												
Sturgeon ..												
Seallion ..	Cammell Laird	1934	208·7	24	10·5	..	670 / 960	1,550 / 1,300	13¾ / 10		6	..
Salmon ..		1935										
Shark	Chatham ..	1934										
Snapper ..		1935										
Seawolf ..	Scott's ..	1936										
Suhfish ..	Chatham ..	Bldg.	..	..	..	..	..	..	..	..	..	..
Spearfish ..	Cammell Laird											
Sterlet.. ..	Chatham ..											
Rainbow Class:												
Rainbow ..	Chatham ..	1932	290	29·8	13·8	..	1,475 / 2,015	4,400 / 1,320	17½ / 9	1 4-in. (Perseus has 1 4·7 in.)	8	53
Regent ..	Vickers-Armstrong	1930										
Regulus ..		1930										
Rover .		1931										
Parthian Class:												
Parthian ..	Chatham ..	1931	290	29·8	13·7	..	1,475 / 2,040					
Perseus ..	Vickers-Armstrong ..	1930										
Proteus ..												
Pandora ..												
Phœnix ..	Cammell Laird	1931										
Odin Class:												
Odin	Chatham ..	1929	283¼	29·8	13·7	..	1,475 / 2,030	4,400 / 1,320	17½ / 9	1 4-in., 2 Lewis	8	53
Olympus ..	Beardmore ..	1930										
Orpheus ..	Beardmore ..	1930										
Osiris	Vickers ..	1929										
Oswald ..	Vickers ..											
Otus	Vickers ..											
Oberon Class:												
Oberon ..	Chatham ..	1927	270	28	13·2	..	1,311 / 1,830	2,950 / 1,350	15 / 9	1 4-in., 2 Lewis	8	53
Oxley ..	Vickers ..	1927	275	27·7	13·3	..	1,350 / 1,870	3,000 / 1,350	15½ / 9	1 4-in., 2 Lewis	8	53
Otway ..												
X Type:												
X1	Chatham ..	1925	363½	29·8	15·3	..	2,425 / 3,600	7,000 / 2,600	19½ / 9	4 5·2 in., 2 Lewis	6	100
L 50 Class:												
L71	Scott's ..	1920	235	23·5	12	..	845 / 1,150	2,400 / 1,600	17½ / 10½	1 4-in., 1 Lewis	6	44
L69 .. .	Beardmore ..	1923										
L56 .. .	Fairfield ..	1919								1 4-in., 1 Lewis		
L54	Denny ..	1924										
L53	Armstrong ..	1925								2 4-in., 1 Lewis		
L52 .. .	Armstrong ..	1921										

* Minelaying submarines.

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Great Britain—*continued.*

SUBMARINES—*continued.*

Name or Number.	Where Built.	Completed	Dimensions. Length (Extreme)	Beam.	Draught.	No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).
			Feet.	Feet.	Feet.		Tons.		Knots.			
L Class:												
L27	Vickers ..	1926								1 4-in., 1 Lewis (L25 carries 14 mines in addition)	4	41
L26	Vickers ..	1926										
L23	Vickers ..	1924	238½	23½	11·7	..	760 / 1,080	2,400 / 1,600	17½ / 10½			
L21	Vickers ..	1920										
L19	Vickers ..	1919										
H Class:												
H50	Beardmore ..	1920										
H49	Beardmore ..	1919										
H44	Armstrong ..	1920										
H43	Armstrong ..	1919										
H34	Cammell Laird	1919	171	15·75	12·5	..	410 / 500	480 / 320	13 / 10½	1 Lewis	4	23
H33	Cammell Laird	1919										
H32	Vickers ..	1919										
H31	Vickers ..	1919										
H28	Vickers ..	1918										

SLOOPS

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
		ft. ins.	ft. ins.	ft. ins.								
SLOOPS.												
Convoy Escorts:												
Egret . .												
Heron . .												
Convoy Sloops:												
‡Enchantress	1190	282	37 0	8 6	3,300	J. Brown	J. Brown	..	Bldg.	2 4·7-*in.* guns.	18	..
*Stork . .												
Bittern .	1180	282	37 0	8 6	3,300	Denny J. S. White	Denny	..	Bldg.	1 small gun 4 4·7-*in.*	18	-
Coastal Sloops:												
Kingfisher	535	234 b.p.	26 6	6 6	3,600	Fairfield	Fairfield	1935	1935	1 4-*in.* gun. 8 smaller	20	..
Mallard .	..	..	..	..	..	Stephen	..	..	Bldg.	..	..	..
Puffin .												
Sheldrake .	..	..	..	..	..	Thornycroft	..	..	Bldg.	..	..	..
Kittiwake.												
Widgeon .	..	..	..	..	..	Yarrow	..	..	Bldg.	..	..	-
Grimsby Class:												
Grimsby .	990	266	36 0	7 6	2,000	Devonport	J. S. White	1933	1934	2 4·7-*in.* guns. 1 3-*in.* 12 smaller	16½	..
Leith .						Devonport						
Lowestoft .						Devonport		1935	1935			
Wellington						Devonport		1934	1935			
Londond'ry						Chatham						
Deptford .												
Aberdeen .	1060	..	..	..	..	Devonport	Thornycroft	1935	Bldg.	3 4-*in.* 12 smaller 4 4-*in.* 12 smaller		
Fleetwood .						Devonport						
SLOOP MINE-SWEEPERS.												
Halycon Class:												
Halcyon .	..	..	..	..	..							
Skipjack .	815†	246	33 6	7 3	1,770	J. Brown	J. Brown	1934	1934	1 4-*in.*, 1 4-*in.* A.A. 1 2-*pr.*	16½ est.	..
Harrier .						Thornycroft	Thornycroft					
Hussar .	..	..	..	..	..	Hamilton	Beardmore	1935	Bldg.			
Speedwel												
Niger . .	875	246	33 6	7 7	8,000	J. S. White	J. S. White	1935	Bldg.	2 4-*in.* 9 smaller	..	..
Salamander												
Hebe . .	..	..	..	..	.	Devonport	..	..	..	..	..	..
Sharp-shooter												
Hazard .	..	..	..	..	..	Wm. Gray	..	..	..	..	..	..
*Gleaner .												

* Will be employed as surveying vessels and will carry 1 small gun only.
‡ In addition to her normal duties Enchantress will be made available for occasional use by the Board of Admiralty.

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Great Britain—*continued.*

SLOOPS—*continued.*

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where Built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
		ft. ins.	ft. ins.	ft. ins.								
***Halcyon Class*—cont.**												
Gossamer	..	..	..	..	..	Hamilton's	Stephen					
Leda	..	..	..	..	..	Devonport	Richardsons, Westgarth					
Seagull	..	..	..	..	..							
*Franklin	..	..	..	..	..	Ailsa	Thornycroft					
*Jason	..	..	..	..	..							
Shoreham Class:												
Repeat Shoreham Class:												
Falmouth	1105†	281 4	35 0	8 3	2,000 P.T. (G.)	Devonport	Hawthorn Leslie	1932	1932	1 *4-in.*, 1 *4-in.* A.A. 4 *3-pr.* 8 L.	16–16½	..
Milford							Yarrow					
Weston							Yarrow					
Dundee						Chatham	Hawthorn Leslie		1933			
Bideford	1105*	281 4	35 0	8 0	2,000 P.T. (G.)	Devonport	J. S. White & Devonport	1931	1931	1 *4-in.*, 1 *4-in.* A.A. 4 *3-pr.* 8 L.	16–16½	..
Rochester						Chatham	J. S. White & Chatham	1932	1932			
Fowey						Devonport	J. S. White & Devonport	1930	1931			
Shoreham						Chatham	J. S. White & Chatham	1930	1931			
Hastings Class:												
Hastings	1025	266 4	34 1	9 1	2,000 P.T. (G.)	Devonport	Devonport	1930	1931	1 *4-in.*, 1 *4-in.* A.A. 2 *3-pr.* 8 L.	16–16½	..
Penzance						Devonport	Devonport	1930	1931			
Folkestone						Swan, Hunter	Hawthorn, Leslie	1930	1930			
Scarborough	1045					Swan, Hunter	Hawthorn, Leslie	1930	1930			
Bridgewater Class:												
Bridgewater	1045	266 4	34 0	8 6	2,000 P.T. (G.)	Hawthorn Leslie	Hawthorn Leslie	1928	1929	1 *4-in.*, 1 *4-in.* A.A., 4 L.	16–16½	95
Sandwich												
Anchusa Class:												
Harebell‡	1345	274 9	35 0	12 0	2,500 recip.	Barclay Curle	Barclay Curle	1918	1918	2 *4-in.* 2 *12-pr.*, 2 L.	16·5	119
Chrysanthemum	1345	276 0	35 0	13 3	2,500 recip.	Armstrong	Wallsend Slipway	1917	1918	2 *3-pr.*	16·5	100
Bryony	1345	275 3	35 0	12 10	2,500 recip.	Armstrong	Wallsend Slipway	1917	1917	1 M., 8 L.	16·5	70
Arabis Class:												
Godetia‡	1175	267 9	33 6	12 0	2,000 recip.	C. Connell	Rowan	1916	1916	1 *4-in.*, 1 *12-pr* 2 L.	16–17	100
Lupin†						Simons	Simons	1916	1916	2 *4-in.*, 4 *3-pr.*, 1 *2-pr.*, 8 L.		
Rosemary						Richardson Duck	Blair	1915	1916	1 *4-in.*, 2 *2-pr.* 2 M., 8 L.		
Acacia Class:												
Foxglove	1165	262 6	33 0	12 6	1,800 recip.	Dunlop Bremner	Dunlop Bremner	1915	1915	2 *4-in.*, 4 *3-pr.* 2 *2-pr.*, 8 L.	16–17	100

* Will be employed as surveying vessels and will carry 1 small gun only.
† Converted to oil-burning. ‡ Fishery protection ships.

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Great Britain—*continued.*

TWIN-SCREW MINESWEEPERS, RIVER GUNBOATS.

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Complement.
TWIN-SCREW MINE-SWEEPERS.												
Aberdare						Ailsa	Ailsa	1918	1918	1 *4-in.*, 1 *12-pr.* A.A. Alresford, Caterham, Ross and Saltburn no armament.	16	73
Abingdon						Ailsa	G. Clark					
Albury						Ailsa	Ailsa	1918	1919			
Alresford						Ailsa	W. H. Allen	1919	1919			
Bagshot						Ardrossan Dry Dock Co.	W. H. Allen	1918	1919			
Derby						Clyde S.B. Co.	Clyde S.B. Co.	1918	1918			
Dundalk						Do.	Do.					
Dunoon						Do.	Do.					
Fermoy						Dundee S.B. Co.	Cooper & Greig	1919	1919			
Fareham						Dunlop, Bremner	Dunlop, Bremner	1918	1918			
Tiverton						Simons	Simons	1918	1918			
Elgin	710	231 0	28 7	9 0	2,200 recip.	Do	Do.					
Sutton						McMillan	Yarrow					
Saltash						Murdock & Murray	Do.	1918	1919			
Saltburn						Do.	Do.					
Selkirk						Do.	D. Rowan	1918	1919			
Ross						Lobnitz	Lobnitz	1919	1919			
Widnes						Napier & Miller	Rowan	1918	1918			
Harrow						Eltringham	Wallsend Slipway					
Huntley						Do.	Eltringham	1919	1919			
Lydd						Fairfield	Fairfield	1918	1919			
Stoke						C. Rennoldson	Shields Eng. Co.	1918	1918			
Pangbourne						Lobnitz	Lobnitz					
Tedworth	675	231 0	28 0	.. 9 0	1,800 recip.	Simons	Simons	1917	1917	1 *3-in.* A.A.	14	35
RIVER GUNBOATS.												
Scorpion	..	..	..	..	..	J. S. White	..	Bldg.	..	..	..	..
Robin	226	150 b.p.	26 8	3 0	800 recip.	Yarrow	Yarrow	1934	1934	1 *3·7-in.* Howitzer, 1 *6-pr.*, 8 L.	12¾	
Sandpiper	185	160 0 b.p.	30 8	1 10	600 recip.	Thornycroft	Thornycroft	1933	1933	1 *3·7-in.* Howitzer, 1 *6-pr.*, 8 L.	11¼	
Falcon	372	150 0	28 8	4 9	2,250 (G.)	Yarrow	Yarrow	1931	1931	1 *3·7-in.* Howitzer, 2 *6-pr.*, 8 L.	15	
Gannet	310	185 0	29 0	4 0	2,250 (G.)	Yarrow	Yarrow	1927	1928	2 *3-in.* A.A., 8 L.	16	60
Petrel								1927	1927			
Seamew	262	168 0	27 0	4 0	1,370 (G.)	Do.	Do.	1928	1928		14	60
Tern								1927	1927			
Aphis	625	237 6	36 0	4 6	2,000 recip.	Ailsa	Ailsa	1915	1915	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.	14	55
Bee						Do.	Do.	1915	1916	1 *3-in.* A.A., 2 *3-pr.*, 1 *2-pr.*, 8 L.		
Cicala						Barclay Curle	Barclay Curle	1915	1916	2 6-*in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Cockchafer						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 8 L.		
Cricket						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Gnat						Lobnitz	Lobnitz	1915	1915			
Ladybird						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* AA., 1 *2-pr.*, 8 L.		
Mantis						Sunderland S.B. Co.	N.E. Marine	1915	1915	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Moth						Do.	Do.	1915	1916	2 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.*, 8 L.		
Scarab						Wood, Skinner	Do.	1915	1915			
Tarantula						Do.	Do.	1915	1916	1 *6-in.*, 1 *3-in.* A.A., 1 *2-pr.* 8 L.		

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Argentine Republic.

Name or Number.	Where Built.	Launched	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Flotilla Leaders—													
Cervantes (*ex*-Spanish Churruca) / Juan de Garay (*ex*-Spanish Alcala Galiano)	Cartagena ..	1925	331¾	31¾	10½	2	1650	42,000	36	5 4·7 in., 1 3-in. A.A., 4 M.	2 triple 21-in.	—	— / 540
Mendoza .. / La Rioja .. / Tucuman ..	J. S. White, Cowes	1928 / 1929 / 1929	318¼	31·8	12¼	2	1520	45,000	36 (La Rioja 39·4 *t.*)	5 4·7 in., 1 3-in. A.A., 2 2-pr., 4 M.	2 triple 21-in.	160	— / 700
Destroyers—													
Catamarca *	Schichau ..	1911	288·7	27¼	10	2	972	18,000	32	3 4-in. 2 1-pr.	4 21-in.	100	—
Jujuy †	Germania ..												
Cordoba *	Shichau ..	1910	295¼	29·5	10	..	1000	28,000	34·7 *t.*			100	—
La Plata †	Germania ..	1911											
Submarines—													
Santa Fe .. .. / Salta .. .. .. / Santiago del Estero	Taranto ..	1931 / 1932 / 1933	226¼	21¾	13	2	850 / 1080	3,000 / 1,300	17·5 / 9	1 4·7-in. 1 2-pr. A.A.	8 21-in.	41	—

* Converted to oil-burning, 1927, at Buenos Aires. † Converted to oil-burning at Buenos Aires.

Seven destroyers are building in Great Britain, three by Messrs. Vickers, Barrow, two by Messrs. Cammell Laird, and two by Messrs. John Brown. The armament for the seven vessels is being made by Messrs. Vickers.

Brazil.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Para .. .. .. / Piahuy .. .. .. / Matto Grosso .. .. / Parahyba .. .. .. / Rio Grande del Norte / Alagoas .. .. .. / Santa Catharina .. / Parana .. .. .. / Sergipe	* / Yarrow ..	1908 / 1908 / 1908 / 1909 / 1909 / 1909 / 1909 / 1910 / 1909	240 p.p.	23·6	7·5	2	560	8,000	27 (27·1–28·7 on trials)	2 4-in., 4 3 prs.	2 18-in.	75	140 / —
Maranhao (*ex*- Porpoise)	Thornycroft..	1913	265·3	26·5	10	..	934	22,500	31	3 4-in., 1 2-pr.	2 dble. 21-in.	..	— / 250
Submarines—													
Humayta	Spezia (Ansaldo Fiat)	1927	282	25·6	14	2	1450 / 1884	4,800 / 2,200	18·5 / 10	14-in. A.A.; carries mines	6 21-in.	55	— / 140
F 1 .. .. / F 3 .. .. / F 5	Spezia (Fiat)	1913	150	13·8	12	..	250 / 370	700 / 500	13·5 / 8	—	2 18-in.	..	..

* In bad condition.

9 destroyers of 1,600 tons, 6 submarines of 1,003 tons, and 6 submarines of 800 tons are approved to be built in eight years. 6 submarines are building in Italy.

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Chile.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Serrano	Thornycroft's	1928	300	29	9	2	1090	28,000	35	3 4·7-in., 1 3-in.	2 triple 21-in.	130	— / 340
Orella													
Riquelme													
Hyatt													
Videla													
Aldea													
Almirante Lynch, Almirante Condell	White.. ..	1912 1913	320 p.p.	32·6	11·1	3	1850	30,000	31	6 4-in. 4 M.	4 18-in.	190	427 / 80
Almirante Riveros (*ex*-Faulknor) ..	White ..	1914	320 p.p.	32·6	11	3	1700 to 1740	30,000	31 31·5	2 4·7-in., 2 4-in., or 2 2-pdr. A.A.	4 21-in.	174	403 / 83
Almirante Uribe (*ex*-Broke) ..													
Almirante Williams (*ex*-Botha)													
SUBMARINES—													
Capitan Thompson ..	Vickers Armstrong's	1929	275	27·5	14·8	..	1520 / 1990	2750 / 1300	15 / 9	1 4-in.	8 21-in.	..	— / 200
Capitan Simpson ..		1929											
Capitan O'Brien ..		1928											
H 1. Gualcola	Fore River, U.S.A.	1915	150·3	15·75	12·3	..	355 / 470	480 / 640	13 / 11	..	4 18-in.	22	— / 17·5
H 2. Tequalda.. ..													
H 3. Rucumilla ..													
H 4. Cuale													
H 5. Quidora													
H 6. Frezia													

3 submarines are projected (no money voted)

Denmark.

Name or Number.	Where built.	Launched.	Dimensions. Length (Extreme).	Beam.	Draught.	Number of Screws.	Displacement	Horse Power.	Speed.	Armament.	Torpedo Tubes	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
TORPEDO BOATS. FIRST CLASS—													
T4. Glentin ..	Royal Dockyard, Copenhagen	1934	198·9	19·5	7·8	..	285	6,000	28	2 3·4-in.	6 17·7 in.	60	— / 40
T5. Hogen													
T6. Ornen													
T3. Laxen		1930	198·9	19·5	7·4	2	281	6,000	28	2 3-in.	8 17·7 in.	46	— / 26
T1. Dragen ..		1929											
T2. Hvalen ..		1930											
R4. Havkatten †		1919	126·3	13·9	9	2	96	2,000	24·6 *t.*	2 6-pr. A.A.	2 (1 in R2-4)	22	15 / —
R5. Sælen † ..		1919											
R3. Nordkaperen †		1918											
R2. Makrelen † ..		1918											
S6. Narhvalen* ..		1917											
S5. Havhesten* ..		1917											
S4. Söhunden* ..		1917											
S3. Sölöven* ..		1916											
S2. Stören* ..		1916											
S1. Springeren* ..													
P1. Hvalrossen †		1913	148·2	16·9	7·5	2	158	3,480	26·2 *t.*	1 3-in.	4 18″	30	28 / —
O3. Söülven ..	Burmeister, Copenhagen Yarrow & Co.	1911	181·7	18	6·5	2	222	5,000	27·5	2 3-in.	5 18″	33	80 / —
O2. Flyvefisken		1911											
O1. Söridderen ..		1911											
N3. Spaekhuggeren	Royal Dock., Copenhagen Schichau												
N2. Vindhunden		1911	184·8	19·1	7·1	2	247	5,000	27·5	2 3-in.	5 18″	34	80 / —
N1. Tumleren ..													
SUBMARINES—													
Daphne. D1 ..	Royal Dockyard, Copenhagen	1926	161	16	8·2	..	305 / 370	900 / 400	13·4 / 7	1 3-in. A.A.	6 18″	18	— / 16
Dryaden. D2 ..													
Flora. C3 ..	,,	1919	155·7	14·4	3·8	..	301 / 369	900 / 640	14·5 / 10·5	1 6-pr.	4 18″	24	— / 13
Bellona. C2 ..													
Rota. C1 ‡ ..	,,	..	133·3	12·3	8	..	181 / 231	450 / 340	13·5 / 9·8	1 6-pr.	3 18″	12	— / 9
Galathea. B12 ..	,,	..											
Triton. B10 ..	,,	1914											
Ran. B9	,,	1915											

* Used as minesweepers. † Used as patrol vessels. ‡ Rota has one deck tube in addition.

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France.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
Flotilla Leaders—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Volta	Ch. de Bretagne, Nantes	Bldg.	452	41·1	15	..	2,884	90,000	38	8 5·4-in. 4 1·5-in. A.A.	9 21·7	240	.. / ..
Mogador	Lorient	Bldg.											
Le Fantasque	Lorient	1934	434½	39½	14	..	2,569	74,000 Terrible did 45 knots on trial.	37	5 5·5-in 4 1·5-in., A.A.	9 21·7 in.	220	— / 650
L'Audacieux													
Le Malin	Ch. de la Mediterranée	1934											
L'Indomptable													
Le Triomphant	Ch. de France												
Le Terrible													
Vauquelin	Ch. de France, Dunkirk	1932	424¼	39	14	2	2,441	74,000	37	5 5·5-in, 4 1-pr. A.A.	7 21·7 in.	220	— / 500
Kersaint	Ch. de la Loire, Nantes	1931											
Cassard	Ch. de Bretagne, Nantes	1932											
Tartu	Ch. de la Loire, Nantes	1931											
Maillié Brézé	Ch. de Penhoet, St. Nazaire	1931											
Le Chevalier-Paul	Ch. de la Mediterranée, Havre	1932											
Aigle	Ch. de France, Dunkirk	1930	426	38	14	2	2,441	74,000	37	5 5·5-in., 4 1-pr. A.A.	6 21·7 in.	220	— / 500
Vautour	Ch. de la Mediterranée, Havre												
Albatros	Ch. de la Loire, St. Nazaire												
Gerfaut	Ch. de Bretagne, Nantes												
Milan	Lorient	1930	426	38	14	2	2,441	75,000	37	5 5·5-in., 4 1-pr. A.A.	7 21·7 in.	220	— / 500
Epervier													
Valmy	Ch. de Penhoet, St. Nazaire	1928	427	37¾	15	2	2,436	70,000	36	5 5·5-in. 4 1-pr. A.A.	6 21·7 in.	216	— / 650
Verdun	Ch. de la Loire, St. Nazaire	1928											
Vauban	Ch. de France Dunkirk	1930											
Lion	Dunkirk	1929	416	36	14·8	2	2,126	50,000	35·5	5 5·1-in., 2 3-in. A.A.	6 21·7 in.	206	— / 530
Bison	Lorient	1928											
Guépard	Lorient	1928											
Chacal	St. Nazaire	1924											
Jaguar	Lorient Dy.	1923											
Leopard	St. Nazaire	1924											
Lynx	,,	1925											
Panthère	Lorient Dy.	1924											
Tigre	Nantes	1924											
Amiral Sénès, *ex*-German S. 113	Germany	1917	346·5	33·5	14·8	2	1,526	44,000	34	4 5·9-in., 2 1-pr.	2 D.	180	— / 700
Destroyers—													
Le Hardi	Loire	Bldg	..	..	..	..	1 772	..	37	6 5·1-in.	6 21 in.	..	..
Mameluck													
Epee	Gironde												
Lansquenet													
Casque	Laseyne												
Fleuret													
Forbin	Ch. de Graville Le Havre	1928	351·7	32·2	10·2	..	1,378	35,000	34	4 5·1-in., 2 1-pr. A.A.	6 21·7 in.	146	— / 300
Frondeur	Ch. Navals Français, Caen	1929											
Fougueux	Ch. de Bretagne, Nantes	1928											
Foudroyant	Ch. de Dyle et Bacalon, Bordeaux	1929											
Basque	Maritime	1929											
Bordelais	Bordeaux	1928											
Boulonnais	Caen	1927											
Brestois	Nantes	1927											
L'Adroit	Dunkirk	1927											
L'Alcyon	Bordeaux												
Le Fortune	Caen	1926											
Le Mars	Caen												
La Palme	Nantes												
La Railleuse	Nantes												

The new programme includes 3 destroyers.

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France—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons
DESTROYERS—*Contd.*													
Bourrasque	Dunkerque	1925											
Cyclone	Havre ..	1925											
Mistral													
Orage	Caen	1924											
Ouragon													
Simoun	St. Nazaire..	1924											
Sirocco	Rouen.. ..		346¼	31·7	10·2	2	1,319	33,000	33	4 5·1-in., 1 3-in. A.A.	6 21·7-in.	140	— / 350
Tempête	Nantes ..	1925											
Tramontane	Bordeaux ..	1924											
Trombe	Harfleur ..												
Typhon	Bordeaux ..	1925											
Tornade	Barcelona ..	1925											
Ens. Roux, M. P. Lestin	Rochefort ..	1915	271	27	10·5	2	787	18,000	30	2 3·9-in., 1 3-in., 4 9 pr.	4 18-in.	98	— / 206
Ens. Gabolde	Havre	1921	271	26·9	10·0	2	802	22,000	33	3 3·9-in., 1 3-in. A.A.	4 21·7-in.	98	— / 200
Vesco, *ex*-S. 134 ..	Germany ..	1917	272·3	27	11·5	2	767	16,800	28	3 4·1-in., 4 M.	6 19·7-in.	113	— / 246
Mazare, *ex*-S. 135 ..													
Matelot Leblanc, *ex*-Austrian, Dukla ..	Fiume ..	1916	277·5	25·7	11·0	2	748	18,000	30·5	2 3·9-in., 6 9-pr.	4 21-in.	120	108 / 52
Téméraire, Intrépide,* Aventurier*	Nantes ..	1911	290·5	28·5	11·5	..	915	24,000	27	4 3·9-in. 1 3-pr. A.A.	4 18-in.	102	236 / 74
Algérien, Arabe, Hova, Kabyle, Sakalave, Sénégalais, Tonkinois	Japan	1917	272	24	10·5	..	601	11,000	29	1 4·7-in., 3 3-in. 1 3-in. A.A.	2 dbl. 18-in.	106	98 / 115

1st class torpedo boats (1905–7), Nos. 321, 349, 369, 85 tons, 2000 H.P., 26 knots, 1 3-in. gun, 1–3 torpedo tubes.
* Converted to oil-burning.

CRUISER SUBMARINES—							Surf. / Sub.	Surf. / Sub.	Surf. / Sub.				
Surcouf..	Cherbourg ..	1929	393·7	29·5	23	2	2880 / 4300	7600 / 3400	19 / 11	2 8-in. 2 1-pr.	14 21-in.	130	..
SUBMARINES—													
Roland Morillot ..	Cherbourg ..	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Agosta	Cherbourg ..	1934											
Beveziers													
Ouessant	Brest ..												
Sidi-Ferruchi		Bldg.	302	26·8	15·5	..	1379 / 2080	8000 / ..	20 / 10	1 3·9 in. 1 smaller	11	..	..
Sfax	Ch. de la Loire.. ..												
Casablanca		1935											
Le Glorieux	Cherbourg ..	1932											
Le Centaure	Cherbourg ..	1933											
Le Héros	Brest ..	1933											
Le Conquerant	Brest ..	1932	302·8	26·8	15·5	2	1379 / 1968	8000 / 2000	21 / 10	1 3·9-in. 1 1·5-in. A.A.	11	61	..
Le Tonnant	Loire ..	1934											
L'Espoire	la Seine ..	1931											
Persée	Ch. Navals Français, Caen												
Protée	Forge et Ch. de la Mediterranée la Seyne	1930	301·8	26·8	15·5	2	1379 / 1968	6000 / 2000	18 / 10	1 3·9-in., 1 1·5-in. A.A.	11	61	..
Pégase	Ch. de la Loire, St. Nazaire												
Phénix	Ch. Dubigeon, Nantes												
Achille	Brest	1933											
Ajax													
Acheron	Ch. de la Loire, St. Nazaire	1929–1930	301·8	26·8	15·5	2	1379 / 1968	6000 / 2000	18 / 10	1 3·9-in., 1 1·5-in. A.A.	11	61	— / 96
Argo	Ch. Dubigeon, Nantes												
Acteon													
Pascal	Brest												
Pasteur													
Poncelet	Lorient ..												
Henri Poincare ..													
Archimede	Caen	1928–1929	302·5	26·8	15·5	2	1379 / 1968	6000 / 2000	18 / 10	1 3·9-in. 1 1·5-in. A.A.	11	61	— / 96
Fresnel..	Ch. de Penhoet, St. Nazaire												
Monge	Ch. de la Mediterranée, la Seyne												

†The new French 3-year programme includes 12 submarines.

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France—*continued.*

Number and Name.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Speed. Surf./Sub.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
CRUISER SUBMARINES—*Contd.*													
*Perle	Toulon	1933	216·5	23·3	13·5	2	669 / 910	1300 / 800–1000	12 / 9	1 3-in., 64 mines	5	40	..
*Diamant		1933											
*Rubis		1930											
*Nautilus		1928											
*Saphir		1929											
*Turquoise		1929											
Redoubtable	Cherbourg	1928	302·5	30·5	15·5	2	1384 / 1968	6000 / 2000	18 / 10	1 3·9-in. A.A. 1 1-pr. A.A.	11	..	— / 96
Vengeur													
Requin	Cherbourg	1924	278·8	22·5	15	2	974 / 1415	2900 / 1800	16 / 10	1 3·9-in. A.A.	10	54	..
Morse		1925											
Narval		1925											
Souffleur		1924											
Caiman		1927											
Dauphin	Toulon	1925											
Espadon		1926											
Marsouin	Brest	1924											
Phoque		1926											
SUBMARINES—													
Aurore	Loire	..	..	..	..	..	..	..	..	..	..	..	..
Minerve	Cherbourg	1934	224	15·8	13	..	597 / 800	1800 / 1230	14¼ / 9	1 3-in.	8 / 21·7	43	..
Junon	Havre	1935											
Venus	Worms	1935											
Iris	Dubigeon	1934											
Orphée	Ch. Normand, Havre	1932	211	15·8	..	..	558–570 / 787	1300 / 1000	13·7 / 9	1 3-in., A.A.	8 / 21″	..	..
Oréade		1932											
Orion		1931											
Ondine		1931											
Psyche	Ch. Normand												
Sybille	Worms	1932											
Vestale	Schneider												
Sultane													
Amphitrite	Le Trait	1932	216¼	16·2	12·7	2	565–571 / 787	1300 / 1000	13·7 / 9·2	1 3-in. A.A.	8 / 21″	..	..
Antiope	Havre	1932											
Atalante	Chalons-sur-Saone	1930											
Amazone	Le Trait	1932											
Diane	Chantiers Normand, Havre	1930											
Meduse		1930											
Argonaute	Schneider et Cie	1929											
Arethuse	Chalons-sur-Saone	1929											
Ariane	Havre	1925	216·5	16	12·8	2	576 / 766	1200 / 1000	14 / 9	1 3-in. A.A.	7 / 21·7″	40	..
Danaé		1927											
Eurydice		1927											
Circé	Chalons	1925	204·5	17·5	12·8	2	552 / 765	1250 / 1000	14 / 9	1 3-in. A.A.	7 / 21·7″	40	..
Calypso		1926											
Doris		1927											
Thetis		1927											
Naïde	St. Nazaire	1925	210	17	12·8	2	548 / 744	1300 / 1000	14 / 9·5	1 3-in. A.A.	7	39	..
Sirène		1925											
Nymphe		1926											
Galatée		1925											
Néréide	Cherbourg	1914	243	19·8	12·3	2	771–1070	2900 / 1500	14 / 12	1 3-in. ..	8 / 18″	40	— / 56
Gustave Zédé	Cherbourg	1913	243	19·7	12·3	..	771–1080	2400 / 1500	16 / 10	1 3-in. ..	8 / 18″	47	— / 68
Joessel, Fulton	Cherbourg	1917	243	20·0	13·4	2	838–1181	2900 / 1650	17 / 10½	2 3-in. ..	8 / 18″	47	— / 118
*Pierre Chailley	Havre	1922	229·7	26·3	13 0	..	798–1181	1800 / 1400	13·7 / 9	1 3·9-in., 2 M 40 mines	4 / 18″	43	— / 54
*Maurice Callot	Bordeaux	1921	247·8	22	11·8	..	843–1270	2900 / 1640	16½ / 10	1 3-in., 40 mines	6 / 18″	48	— / 44
Pierre Marrast (*ex*-U. 162)	,,	1918	235	21	12·7	2	744–1030	2400 / 1200	16 / 8·5	1 4-in., 1 M.	6 / 19·7″	48	— / 98
Jean Autric (*ex*-U.105)	,,	1917	234·5	21	12·5	..	744–1036	2400 / 1200	16·5 / 8·5	1 4·1-in., 1 M.	6 / 19·7″	48	— / 81
Leon Mignot (*ex*-U.108)													
Jean Corre (*ex*-U.B. 155)	,,	1917 / 1918	182·5	19	12	..	464–640	1100 / 760	12 / 7·5	1 4·1-in., 1 M.	5 / 19·7″	34	— / 74
*René Audry (*ex*-U. 119)	,,	1917	267·5	24	14	..	1041–1525	2400 / 1200	14·5 / 7·2	1 5·9-in., 1 M 42 mines	4 / 19·7″	54	— / 132

French submarines are divided into two classes. 1st class: All vessels of 850 tons and above in the surface condition, including the U minelayers. 2nd class: All smaller vessels.

* Mine-laying submarines.

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Germany.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet		Tons.		Knots.				Tons.
DESTROYERS—													
16 *building* ..	..	..	..	..	..	..	1625	..	..	5 5-in.	8	..	..
Iltis	Wilhelmshaven	1927	304	28¼	8¾	2	800	23,000	34	3 4·1-in.	6 19·7 in. (T.)	115	— / 300
Wolf		1927											
Tiger		1928											
Luchs													
Jaguar													
Leopard													
Seeadler	Wilhelmshaven	1926	287¾	27¼	9½	2	800	23,000	33	3 4·1-in.	6 19·7 in. (T.)	111	— / 300
Greif		1926											
Albatros		1926											
Kondor		1926											
Falke		1926											
Möwe		1926											
*G. 11..	Germania Works, Kiel	1911–1912	233†	25	10	2	650	16,000	32	2 4·1-in., 7 M.	2 19·7 in.	90	140 / 60
*G. 10..													
*G. 8													
*G. 7													
TORPEDO BOATS—													
T. 23	Shichau Elbing Kiel	1913	234·6	24·6	10	2	630	15,700	32	2 4·1-in., 7 M.	2 19·7 in.	90	132 / 55
T. 196	Vulcan Works, Stettin	1911–1910	243	26	10·5	2	787	18,000	32	2 4·1-in., 2 M.	2 19·7 in.	98	160 / 54
T. 190													
T. 151, 153, 155–8 ..	..	1907–8	237	25½	10·1	2	664	10,900	30	2 3·9-in.	2 19·7 in.	97	— / 172
SUBMARINES—													
U 1–13, U 17 ..	..	1935	136	13	12½	..	250 / —	700 / —	13 / 7	1 M.G.	3	..	..
U 14–16, *U* 19–20 ..	..	1935	..	..	..	..	250 / —	700 / —	13 / 7	1 M.G.	3	..	..
I–II	..	1935	..	..	..	..	750 / —	..	..	..	..	..	..
III–VIII	..	1935	..	..	..	..	500 / —	..	..	..	..	..	..

* Classified as torpedo boats in German official lists. † Length increased during alterations, 1929–30.

Greece.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Hydra	Odero, Genoa	1931	308 8	30·3	10·5	..	1230	30,000	40	4 4·7 in., 4 2-pr. A.A.	6 21-in. (T.)		
Conduriotis													
Spetsai			308·8	30·3	11·3	..	1308						
Psara													
Thyella	Yarrow ..	1906	220	20·6	9·0	2	305	6000	30	2 3-in. 1 2-pr.	2 18-in.	70	80 / —
Sphendoni													
Niki	Stettin (Vulcan)	1906	220	20·6	9·0	2	275	6000	30	2 3-in., 4 6-pr.	2 21-in.	70	80 / —
Aspis													
*Aetos, *Leon, *Panther, *Ierax ..	Birkenhead	1911	293	27·7	9·6	..	1013	19,750	32	4 4-in., (Panther and Aetos. 40 mines)	6 21-in. (T.)	110	— / 260
TORPEDO BOATS—													
Arethusa	Stettin (Vulcan)	1913	147·3	9	4	..	142	2400	25	2 6-pr-	3 18-in.	..	..
Doris													
†Aigli													
†Alkyonis													
‡Pergamos	Fiume	1914	178·4	18 8	5	..	237	5000	28½	1 11-pr.	..	..	..
‡Proussa													
‡Kios	Monfalcone												
‡Kyzikos													
‡Kydonia													
SUBMARINES—							Surf. / Sub.		Surf. / Sub.				
Katsonis	Schneiders, Harfleur	1926	203¾	17·7	12·3	..	567 / 760	1300 / 1000	14 / 9·5	1 4-in., 1 2-pr. A.A.	6 21-in.	30	..
Papanicolis	Ch. de la Loire, Nantes												
Nereus	Ch. de la Loire, Nantes	1927–1927	226½	18¾	12·6	2	689 / 945	1500 / 1200	14 / 9·5	1 4-in., 1 2-pr. A.A.	8 21-in.	45	..
Proteus													
Triton		1928											
Glaucos	Ch. de France, Caen	1928											

New programme includes 10 destroyers and a number of submarines. Contracts will be invited from foreign firms willing to undertake construction in Greece. The work will be spread over a number of years. Two destroyers building by Messrs. Yarrow.

* Reconstructed by Messrs. J. S. White & Co., Cowes, 1924–25. † On sale list.
‡ Surrendered Austrian torpedo-boats employed on police duties.

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Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal. / Oil.
			Feet.	Feet.	Feet.		Tons		Knots.				Tons
*Flotilla Leaders—													
U. Vivaldi	Genoa (Odero)	1929	351 b.p.	33·3	17	..	1628	50,000	38	6 4·7-in. (in pairs) 6 2-pr. A.A. (L. Malocello has 4 1·5-in. A.A.). Carry mines	6 21-in. (T.)	200	— / 500
A. Usodimare ..		1929											
L. Tarigo	Genoa (Ansaldo)	1928											
L. Malocello		1929											
L. Pancaldo	Riva Trigoso (Cant. Navali)	1929											
A. Da Noli		1929											
E. Pessagno	Ancona (Cant. Navali)	1929											
N. Da Recco		1929											
N. Zeno	Fiume ..	1928											
G. Da Verazzano ..		1928											
A. da Mosto		1929											
A. Pigafetta		1929											
Leone	Ansaldo ..	1923	359·3 b.p.	34·3	11·5	2	1525	42,000	34	8 4·7-in. (in pairs), 2 3-in. A.A., 60 mines.	6 18-in. (T.)	210	— / 350
Pantera		1924											
Tigere		1924											
Aquila	Pattison ..	1916	310 b.p.	31	10·8	2	1407	39,800	36·5	4 4·7-in. (in pairs), 2 3-in. A.A., 50 mines	4 18-in. (D.)	140	— / 260
Falco	Pattison ..	1916					1285						
Premuda .. .. .. (ex-German V116)	.. .. ..	1918	347·8	34	14·2	2	1526	48,000	36	4 5·9 in., 2 2-pr A.A.	4 19·7in. (D.)	150	— / 720
Augusto Riboty ..	Ansaldo ..	1915	331·3 b.p.	32·2	9·8	2	1382	35,000	35	8 4-in., 4 2-pr. A.A., 100 mines.	4 18-in. (D.)	150	— / 314
Carlo Mirabello ..		1914											
Destroyers—													
L. Oriani	Orlando.	Laid down 1935	..	..	..	..	1449	44,000	38	4 4·7-in. 8 smaller A.A. guns	6	..	..
V. Alfieri													
V. Gioberti													
Cr. Carducci													
†Aldebaran	Ansaldo	Bldg.	..	..	..	..	600	..	..	..	..	..	..
†Altair													
†Andromeda													
†Antares													
†Canopo	Ancona												
†Cassiopea													
†Castore													
†Cigno													
†Sagittario	Fiume												
†Vega													
†Centauro	Ancona	1935	..	..	..	..	615	19,000	34	3 3·9-in. 2 smaller A.A. guns	4	..	..
†Climene													
†Sirio	Fiume	1935											
†Perseo													
†Spica	Partenopei,	1934	256	26	8·5	..	615	19,000	35	3 3·9-in 6 smaller	..	..	..
†Astore	Naples	1934											
Maestrale	Fiume	1934	341	33	10	2	1449	50,000	38	4 4·7-in., 4 smaller A.A.	6 21-in.	..	..
Grecale	Ancona	1934											
Libeccio	Ancona	1934											
Scirocco	Genoa												
Dardo	Odero, Sestri Pozente	1930	311	30	11	..	1206	44,000	38	4 4·7-in. 4 M. A.A.	6 21-in. (T.)	..	oil
Strale													
Freccia	Cant. Navale di Tirreno, Sestri Levante	1931											
Saetta		1932											
Folgore	Cantieri Partenopei, Naples	1931	315	30·5	10	..	1220	44,000	38	4 4·7 in. 4 M. A.A.	6 21-in. (T.)	..	oil
Lampo													
Baleno	Quarnaro Yard, Fiume												
Fulmine													
Borea	Ansaldo, Genoa	1927	311½	30	11	2	1073	35,000	36	4 4·7-in., 3 2-pr. A.A. 3 M., 52 mines	6 21-in. (T.)	140	— / 340
Zeffiro		1927											
Espero		1927											
Ostro		1928											
Aquilone	Odero, Genoa	1927					1092						
Turbine		1927											
Nembo	Genoa Docks Co.	1927											
Euro		1927											
N. Sauro	Odero Quanaro, Fiume	1926	295½	30·2	10·5	..	1058	32,000	35	4 4·7-in., 3 2-pr. A.A. 3 M., 52 mines	6 21-in. (T.)	140	— / 340
C. Battisti		1926											
F. Nullo		1925											
D. Manin		1925											
Francesco Crispi ..	Naples (Pattison)	1925	278·6	28·2	10	2	935	28,000	35	3 4·7-in., 2 2-pr. A.A. 2 M., 40 mines	2 dbl. 2 1-in.	106	— / 200
Giovanni Nicotera		1926											
Bettino Ricasoli ..		1926											
Quintino Sella ..		1925											
Alessandro Poerio ..	Genoa (Ansaldo)	1914	279	26·3	9·3	2	844	20,000	32	5 4-in., 2 2-pr. A.A.	4 18-in. (D.)	100	— / 250
Gulielmo Pepe ..													
†Impavido	Naples (Pattison)	1913	239½	24·0	8·4	2	540	13,500	30	5 4-in., 12-pr. A.A. 1 M., 10 mines	4 18-in. (D.)	71	— / 110
†Indomito		1912											
†Insidioso		1913											
†Irrequieto		1913											
†Ardente	Orlando (Leghorn)	1912	239½	24·0	8·4	2	560	13,800	30	5 4-in., 12-pr. A.A 10 mines	2 18-in.	71	— / 110

* Designated scouts in Italian official lists. † Designated torpedo boats in Italian official lists.

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Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
DESTROYERS—*contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
†Giuseppe Sirtori †Vicenzo Orsini †Francesco Stocco †Giovanni Acerbi	Genoa (Odero)	1916 1917 1916 1916	237¾	24	9·0	2	669	15,000	32–33·8	6 4-in., 4 2-pr. A.A. 2 M.	4 18-in. (D.)	100	— / 150
†E. Cosenz †Giacomo Medici †G. La Farina †Nicola Fabrizi †Angelo Bassini †Giacinto Carini †G. La Masa	Genoa (Odero)	1918 1917 1918 1917 1917 1917 1917	237¾	24	9·0	2	635	15,500	31–34	4 4-in., 2 3-in., 2 M. 10 mines.	4 18-in. (D.)	100	— / 150
†Fratelli Cairoli †Antonio Mosto †Rosolino Pilo †Giuseppe Abba †Ippolito Nievo	Naples (Pattison) Genoa (Odero)	1914	36	24	8·8	2	615	13,500	30	5 4-in., 2 2-pr. A.A. 2 M.	4 18-in. (D.)	71	— / 150
Cesare Rossarol, *ex*-German B97	Hamburg	1915	321½	30·6	9·5	2	744	40,000	34	3 4·7-in., 2 3-in. A.A. 24 mines	4 19·7in. (D.)	114	— / 526
*Simone Schiaffino *Giuseppe Dezza *Giuseppe Missori *Gen. A. Cantore *Gen. A. Chinotto *Gen. A. Papa *Gen. A. Cascino *Gen. M. Prestinari *Gen. C. Montanari	Genoa (Odero)	1914 1914 1915 1921 1922	236 240½	24 24	8·8 9·0	2 2	615 635	13,500 18,000	30 30	5 4-in., 2 2-pr. A.A. 2 M. 3 4-in., 2 3-in. A.A. 2 M.	4 18-in. 4 18-in. (D.)	71 100	— / 150 — / 150
Audace (*ex*-Japanese Kawakaze)	Yarrow	1917	287	27·5	8·3	2	628	21,500	34·5	7 4-in., 1 2-pr. A.A. 2 M.	4 18-in. (D.)	111	— / 252
Ardimentoso, *ex*-German S. 63	Schichau	1915	272	27·3	8·6	2	803	24,000	33	3 4-in., 2 3-in., 24 mines	4 19·7in. (D.)	98	— / 305
Solferino, Palestro S. Martino, Curtatone Confienza, Castelfidardo, Calatafimi, Monzambano	Leghorn (Orlando)	1921 1922 1923	269 283½	26·5	8·6	2	860 966	18,000	32–33·5	4 4-in., 2 3-in. A.A., 2 M., 24 mines	4 18-in. (D.)	115	— / 170
Cortellazzo Grado Monfalcone Zenson (*ex*-Pola)	Danubius (*ex*-Austrian)	1917 1913	274	25·5	8·2	2	561 594	22,000	32	2 3·9-in. 4 3-in. 6 smaller	4 18-in. (D.)	102	110 / 140
TORPEDO BOATS—													
Albatross O.L.T., 75	Orlando	1934 1918	139·5	15	5·5	2	340 169	3,400	28–29	2 3·9 in. 2 3-in. A.A.	2 2	.. ..	.. ..
SUBMARINES—													
No. 1 No. 2	Adriatico	Bldg.	..	..	..	..	667	..	..	..	..	..	..
Perla Diaspro Gemma Berillo Turchese Corallo	Montfalcone	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Malachite Ambra Iris Onice	Spezia	Bldg.	..	..	..	..	..	..	..	..	..	..	..
Zoea † Foca †	Taranto	Bldg.	..	..	..	..	915 / —	..	17 / 8	..	..	..	..
Calvi † Finzi † Tazzoli	Spezia	1935	275	24·5	..	..	1332 / 1965	4400 / 1800	17 / 8·75	2 4·7 in.	8 21-in.	..	..
Diamante Smeraldo Rubino & Topasio Zaffiro & Amestista Serena, Naiade, Nereide, Anfitrite, Galatea, Ondina	Taranto Fiume Orlando Monfalcone	1933	202	18·5	15	2	590 / 787	1,350 / 800	14 / 8·4	1 3·9-in.	6 21-in.	..	..
Archimede, Galileo, Torricelli, Ferraris	Taranto	1934	231½	22½	13	2	880 / 1231	3,000 / 1,300	17·5 / 8·5	1 3·9-in.	8 21-in.	..	-
Glauco † Otaria †	Monfalcone	1934	240	23½	14½	2	860 / 1167	3,000 / 1,040	17·0 / 8·5	2 3·9-in.	8	..	..
3 ("Balilla" class)	Spezia	Bldg.	..	..	..	2	1333 / 1965	4,400 / 1,800	17 / 8·75	1 4·7-in., 1 smaller	8	..	..
Pietro Micca †	Taranto	1935	296	25½	17·5	..	1371 / 1883	3,200 / 1,500	16·0 / 8·5	2 4·7-in., 1 smaller	6 21-in.	..	..
Squalo, Narvalo, Delfino, Tricheco	Cantiere N., Triestino	1930	229	19	14·5	..	810 / 1077	3,000 / 1,400	16·5 / 9	1 4-in.	6 21-in.	64	..
Argonauta, Fisalia, & Medusa	Cantiere N., Triestino	1931											
Jalea & Jantina Serpente (*ex*-Nautilus) & Salpa	Odero-Terni Taranto	1932	260	19·5	13	..	599 / 791	1,200 / 800	14 / 8·5	1 4-in.	6 21-in.	..	..

* Designated torpedo boats in Italian official lists. † Minelayer.

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Italy—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
SUBMARINES—*contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Santorre Santarosa Ciro Menotti	Ansaldo ..	1929	230	19	15·5	..	815 / 1078	3,000 / 1,300	17·5 / 9	1 4-in.	8 / 21-in.	..	..
Fratelli Bandiera .. Luciano Manara .. Luigi Settembrini ..	Monfalcone	1929											
Ruggiero Settimo ..	Taranto ..	1930					797 / 1134	3,000 / 1,400					
E. Fieramosca ..	Taranto (Tosi)	1930	277	27	16·8	..	1340 / 1760	6,000 / 2,000	19 / 10	1 4·7-in. 1 3·9-in.,	8 / 21-in.	..	— / 80
M. Bragadino .. F. Corridoni	Taranto (Tosi)	1929 1930	233	18·6	14	2	802 / 1051	1,500 / 1,000	14 / 8	1 4-in., 24 mines	4	..	— / 41
Ballila	Spezia, Ansaldo	1927	285	25·6	14	..	1368 / 1874	4,400 / 2,200	18·5 / 9	1 3·9-in.	6 / 21-in.	..	— / 140
A. Sciesa.. .. .. E. Toti .. .. .. D. Millelire		1928 1928 1927											
V. Pisani.. .. .. M. Colonna .. .. Da. Geneys	Montfalcone, Trieste	1927 1927 1928	223	18·7	13·8	..	791 / 1040	3,000 / 1,000	17·5 / 9	1 4-in. 1 M.	6 / 21-in.	..	— / 48
G. Bausan .. .. G. Mameli		1928 1926											
P. Capponi .. .. T. Speri	Taranto ..	1927 1928	213·3	21·5	13	..	770 / 994	3,000 / 1,000	17 / 9	1 4-in.	6 / 21-in.	..	— / 48
G. Da. Procida ..		1928											
L. Mocenigo .. .. L. Galvani	Venice.. ..	1918 1919	211·7	20·3	15·6	..	780 / 900	2,600 / 1,300	17 / 10	2 3-in., 1 M.	6 / 18-in.	32	— / 50
X 2, 3	Ansaldo ..	1916	139·9	18	11	..	390 / 460	660 / 360	10 / 6·3	1 3 in. A.A. 1 M., 18 mines	2 / 18-in.	..	— / 8
H 1, 2, 3, 4, 6, 7, 8	Vickers ..	1917	150·3	15·8	12	..	336 / 466	620 / 480	13 / 10	1 3-in. A.A. 1 M., H1, 4, and 6 only	4 / 18-in.	22	— / 18

Japan.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Compliment.	Fuel. Coal / Oil
DESTROYERS:			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
FIRST CLASS—													
Arashio .. .. Oshio .. .. Mitsushio .. Asagumo.. .. Minegumo .. Kasumi .. .. Yamagumo .. Natsagumo .. Kinone			Bldg.										
Yudachi .. .. .. Harusame .. .. Samidare .. .. .. Umikaze .. .. .. Yamakaze .. .. Kawakaze .. .. Suzukaze .. .. .. Asashio .. .. .. Nurasame .. .. Shigure .. .. .. Shiratzuyu	Sasebo .. Maizuru .. Uraga .. Maizuru .. Uraga.. .. Sasebo .. Uraga.. .. Maizuru .. Sasebo .. Uraga.. .. Sasebo ..	1935–1936	336	32	.	..	1368	37,000	34	5 5-in. 2 M.G.	8 / 21″	..	..
Hatsushima .. .. Ariake .. .. .. Yugure .. .. .. Wakaba .. .. .. Nenohi .. .. .. Hatsuhara	Uraga .. Kawasaki .. Maizuru .. Sasebo .. Uraga .. Sasebo ..	1933–1934	338	32·7	8·8	..	1378	37,000	34	5 5-in. guns	9	..	..
Oboro .. .. .. Akebono .. .. .. Sazanami .. .. Ushio .. .. .. Akatsuki.. .. .. Hibiki .. .. .. Ikazuchi .. .. .. Inazuma	Sasebo Fujinagata Maizuru Uraga.. Sasebo Maizuru Uraga.. Fujinagata	1929–1932	368 b.p.	34	10·7	..	1700	40,000	34	6 5-in., 2 M.	9 / 21-in.	210	..

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Japan—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length (extreme).	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement	Fuel Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—*contd.*													
FIRST CLASS—*contd.*													
Sagiri	Uraga	1929											
Asagiri	Sasebo	1929											
Yugiri	Maizuru	1930											
Amagiri	Tokyo	1930											
Shikinami	Maizuru	1929											
Ayanami	Fujinagata	1929											
Fubuki	Maizuru ..	1927											
Shirayuki	Yokosuka ..	1928	368 b.p.	34	10·7	..	1700	40,000	34	6 5-in., 2 M.	9 21-in.	210	..
Hatsuyuki	Maizuru ..	1928											
Murakumo	Fujinagata	1928											
Shinonome	Sasebo.. ..	—											
Usugumo	Ishikawa-jima (Tokyo)	1927 1927											
Shirakumo	Fujinagata..	1927											
Isonami	Uraga	1927											
Uranami	Sasebo ..	1928											
Minadzuki	Uraga	1926											
Fumitsuki	Fujinagata..	1926											
Nagatsuki	Ishikawajima	1926											
Kikudzuki	Maizuru ..	1926											
Mikadzuki	Sasebo.. ..	1926											
Mochidzuki	Uraga ..	1927											
Yudzuki	Fujinagata	1927	320 b.p.	30	9·8	2	1315	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	148	— / 400
Yayoi	Uraga	1924, 25											
Udzuki	Ishikawajima	1925											
Mutsuki	Sasebo.. ..	1924, 25											
Kisaragi	Maizura ..	1925											
Satsuki	Fujinagata..	1925											
Oite	Uraga	1924, 25											
Hayate	Ishikawajima	1925											
Yunagi	Sasebo.. ..	1924, 25											
Kamikaze ..	Nagasaki ..	1922											
Asakaze													
Harukaze ..	Maidzura ..	1922–24	320 b.p.	30	9·6	..	1270	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	148	— / 400
Matsukaze ..													
Hatakaze													
Asanagi	Fujinagata..	1924											
Sawakase..	Nagasaki ..	1919–22											
Okikase, Shimakase, Nadakase, Yukase,													
Hakase, Minekase	Maidzuru ..												
Namikase, Numakase, Nokase, Tashikase, Shiokase, Hokase, Yakase, Akikase	Mitsubishi, Kawasaki, Maidzuru	1920–22	320 b.p.	29·25	9·5	2	1215	38,500	34	4 4·7-in., 2 M. A.A.	6 21-in.	149	— / 400
Urakase	Yarrow ..	1915	287·3	27·6	9·5	—	810	22,000	28	1 4·7-in., 4 3-in.	4 21-in.	116	— / 248
SECOND CLASS—													
Wakatake ..	Kawasaki, Kobe	1922											
Kuretake ..													
Fuyo	Fujinagata..	1922, 23	275 b.p.	26·5	8·3	..	820	21,500	31·5	3 4·7-in., 2 M. A.A.	4 21-in.	110	— / 250
Karukaya ..													
Asagao	Ishikawa-jima	1922–23											
Yugao													
Sanaye	Uraga	1923											
Yanagi, Momo ..	Sasebo.. ..	1916–18	275·0 b.p.	25·3	7·9	2	755	16,000	31·5	3 4·7 in., 2 M.	6 18-in.	109	92 / 212
Kashi, Hinoki ..	Maidzuru ..												
Kaya	Yokosuka ..												
Nashi, Kaki, Take	Kawasaki ..												
Kuri	Kure	1917–19	275·5 b.p.	26	8	2	770	21,500	31·5	3 4·7 in., 2 M. A.A.	4 21-in.	80	— / 290
Nire, Tsuga	Ishikawa-jima												
Hagi	Uraga												
Susuki, Yomogi	Ishikawa-jima												
Sumire													
Hishi, Hasu	Uraga, Fujinagata, Kawasaki	1920–1922	275·5 p.p.	26	8	2	770	21,500	31·5	3 4·7 in., 2 M., A.A.	4 21-in.	80	— / 290
Tade, Fuji													
Aoi, Kiku ..													
Tsuta, Ashi, ..													
TORPEDO BOATS—													
*Tomozuru													
Chidori	Maizuru ..	1933	254	24	6	..	about 527	7000	26	3 4·7 in.	2	..	..
Manazuru	Fujinagata												
Tomazuru	Maizuru ..	1933											
Hatsukari	Fujinagata												

* Capsized in 1934 but has been repaired and put into commission again.

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Japan—*continued.*

Name or Number.	Where Built.	Launched.	Dimensions. Length (extreme).	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
TORPEDO BOATS—*contd.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Otari	Maizuru												
Hyodori	Ishikawa-jima												
Hayabusa	Yokohama												
Kasasagi	Osaka	1935	263	26	6¾	..	595	9000	28	3 4·7 in. 1 M.G.	3 21 in.	..	..
Kari													
Sagi													
Haro													
Kiji													
SUBMARINES—							Surf. / Sub						
I68	Kure	1933											
I69	Kobe												
I70	Sasebo.. ..	1934	331	27	13	..	1400 / —	..	..	1 4·7 in.	6	..	..
I71	Kawasaka ..												
I72 and I73	..	Bldg.											
I74 and I75													
I8	Kawasaki ..	Bldg.	..	..	..	..	1950 / —	6000 / —	17 / —	2 5·5 in.	..	..	..
I7													
I6	Kawasaki ..	1932	320	30	15·7	..	1955 / —	6000 / —	17 / —	2 5 in.	6 21-in.	60	..
I5													
I65	Kure												
I66	Sasebo ..	1931	321	25·6	15·9	..	1638 / 2100	6000 / 1800	19 / 9	1 4-in. 1 M.	6 21-in.	..	..
I67	Kobe												
I61	Mitsubishi..	1929											
I62	Kobe	1928	320¼	25·7	16	..	1635 / 2100	6000 / 1800	21 / 7·9	1 4·7 in.	6	56	— / 255
I64	Kure	1929											
I4	Kawasaki ..	1929											
I1, I2, I3 ..	Kawasaki ..	1926	320	30·2	15·7	..	1955 / 2480	6800 / 1800	17 / 9	2 5·5 in. 1 M.	6 21-in.	61	— / 520
†I21	..	1927											
†I22	Kawasaki ..	1928	279½	24·6	14	..	1142 / 1470	2400 / 1200	14 / 9·5	1 5·5-in.	4	45	..
†I23		1928											
†I24		1928											
I53	Kure	1927											
I55	Kure	1927											
I56	Kure	1929											
I54	Sasebo ..	1927											
I63	Sasebo ..	1928	331¼	26	16	..	1635 / 2100	6000 / 1800	21 / 7–9	1 4·7-in.	8 21-in.	56	— / 255
I60	Sasebo ..	1929											
I59	Yokosuka ..	1929											
I58	Yokusuka ..	1928											
I57	Kure	1929											
Ro. 34	Kobe	Bldg.	..	..	..	..	700	1200	16 / —	1 3-in. A.A.	..	..	..
Ro. 31	Mitsubishi..	1927	243½	20	12·4	..	655 / 1000	1200 / 1200	13 / 10	1 3-in.	6	43	— / 75
Ro. 65	Mitsubishi..	1926											
Ro. 66	Mitsubishi..	1927											
Ro. 67	Mitsubishi..	1927											
Ro. 68	Mitsubishi..	1925	250	24·2	12 4	..	988 / 1300	2400 / 1800	16 / 10	1 3-in. 1 M.	6	47	— / 75
Ro. 64	Mitsubishi..	1925											
Ro. 63, 62, 61	Mitsubishi..	1924											
Ro. 60	Mitsubishi..	1923											
I. 51 ‡	Kure ..	1924	300	28·7	15	..	1390 / 2000	6000 / 1800	19 / 7–9	1 4·7-in.	8	..	— / 190
I. 52		1925	330	25	16·8								
Ro. 32, 30	Kawasaki ..	1924	243·5	20	12·4	..	655 / 1000	1200 / 1200	13 / 10	1 4-in.	4	43	— / 75
Ro. 29	Kawasaki ..	1923											
Ro. 28	Sasebo ..	1923	230 b.p.	20·1	12	..	746 / 1000	2600 / 1200	16 / 10	1 3-in. 1 3-pr.	4 21-in	..	— / 75
Ro. 27	Yokosuka ..	1924											
Ro. 26	Sasabo ..	1922											
Ro. 59	..	1923	250	23·5	13	..	889 / 1082	2400 / 1200	17 / 10·5	1 3-in. 1 3-pr.	4 21-in.	65	— / 76
Ro. 58, 57	..	1922											
Ro. 25, 19, 18, 17 ..	Sasebo, Kure	1921											
Ro. 24	Sasebo ..	1920											
Ro. 23	Yokosuka ..	1923	230	20	12·2	..	735 / 986	2600 / 1200	17 / 10	1 3-in. H.A. 1 3-pr.	6 18-in.	43	— / 75
22, 21, 20, 16 ..	Yokosuka, Kure	1922											
Ro. 56, 55	Mitsubishi..	1922											
54, 53	Mitsubishi..	1921	231·5	23·5	13	..	893 / 1082	2400 / 1200	17 / 10·5	1 3-in. H.A. 1 3-pr.	6 18-in.	65	— / 76
51	Mitsubishi..	1920											

† Fitted for minelaying. ‡ Carries small seaplane.

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Netherlands.

Name or Number.	Where built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-power.	Maximum speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal. / Oil.
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
Flotilla Leader—													
‡Nederland	Netherlands S. B. Co., Amsterdam	..	..	..	..	..	3350	50,000	32½	6 5·9 in. 4 5-in. 4 1½-in. A.A.	6 21″	285	..
Destroyers—													
*Banckert ..	Burgerhout	1929	321·5	31	9 8	2	1316	31,000	34	4 4·7-in., 1 3-in. A.A., 4 1-pr., 4 M. 1 seaplane 24 mines	6 21″	126	—/330
*Van Nes ..	Rotterdam	1930											
*Van Galen	Fijenoord	1928											
*Witte de With	Rotterdam	1928											
Van Ghent	Flushing	1926	321·5	31	9·8	2	1316	31,000	34	4 4·7-in. 2 3-in. A.A. 24 mines 1 seaplane	6 21″	126	—/330
*Evertsen ..	Rotterdam	1926											
*Piet Hein ..		1927											
*Kortenaer		1927											
1st Class Torpedo Boats—													
G 13, 15 and 16 ..	Scheldt Fijenoord	1913–1914	162·5	17·3	9·0	..	150	2,600	25	2 3-in.	3 17·7″	27	40/—
Z 3	Amsterdam	1916–1917	201	20·4	6	2	277	5,500	27	2 3-in., 2 M.	4 17·7″	39	61/8
Z 5–8 ..	Scheldt Fijenoord	1915	192	19·8	5·5	2	264	5,500	27	2 3-in., 2 M.	4 17·7″	39	70/7
Submarines—							Surf. / Sub.						
K XIV ..	Rotterdam	1932–3	242	21·5	13·3	..	810 / 1,000	3000 / 1000	17 / 9	1 3·5-in., 2 2-pr.	6	..	..
K XV ..													
K XVI ..													
K XVII ..	Fijenoord		242	20·3	12·5	..	770 / 1,030	3,200 / 1,000	..	1 3·5-in., 2 2-pr.	4 21″	35	..
K XVIII ..													
K XIX ..	Rotterdam	Bldg.	..	..	..		765 / 1,020	..	..	..	..	..	..
K XX ..													
O 12 ..	De Schelde	1931	199	18·7	11·5	..	560 / 700	1,900 / 600	15 / 8	2 1·5-in. A.A.	5 21″	..	..
O 13 ..													
O 14 ..													
O 15 ..													
O 16 ..	De Schelde	Bldg.	254	21·5	13	..	878 / —	3,200 / 860	18 / 9	1 3·5-in. 2 1·5-in.	5 21″	..	..
†K XIII ..	Fijenoord	1924	218 8	20·2	12·2	..	660 / 810	2,400 / —	15 / 8	1 22-pr., 1 maxim	6	31	—/45
†K XII ..													
†K XI ..													
O 11.. ..	Fijenoord Amsterdam Flushing	1925	179½	18·7	11½	..	506 / 627	900 / —	12¾ / 9	1 22-pr. A.A., 1 maxim	5 21″	29	—/21
O 10 ..													
O 9													
O 8 (*ex*-British H6)	..	1914	150·3	15·8	12·3	..	364 / 434	480 / 320	13 / 8·5	1 maxim	4 17·7″	26	—/18
M1 (*ex*-German UC 8)	Hamburg	1915	111½	10·3	9	..	157 / 176	80 / 155	7½ / 5	1 4-pr. 12 mines	—	16	—/2½
O 7	Fijenoord	1916	112	12·8	9·5	..	177 / 206	350 / 185	11·5 / 8 5	1 maxim	3 17·7″	12	—/5·4
O 6	De Schelde	1916	115·9	12·8	9·5	..	187 / 226	350 / 185	11·5 / 8·5				
O 5	De Schelde	1913	105 3	10·2	9·5	..	129 / 147	300 / 170	11 / 8·5	1 maxim	2 17·7″	10	—/3·6
O 4	De Schelde	1913											
O 3	De Schelde	1912											
†K X ..	De Schelde	1923	212	18·3	11·9	..	560 / 690	1,550 / 630	15 / 8	1 22-pr. 1 maxim	4 17·7″	29	—/45
†K IX ..		1922											
†K VIII ..		1922						1,800 / 630					
†K VII ..	Fijenoord	1921	177·2	16·8	12·5	..	550 / 630	1,200 / 600	15 / 8	1 3-in., 1 maxim	6 17·7″	29	—/76
†K VI ..		1920											
†K V		1919											
†K IV ..	De Schelde	1920	211·3	18·3	11·5	..	560 / 700	1,200 / 600	15 / 8	1 3-in., 1 maxim	6 17·7″	29	—/45
†K III ..		1919						1,800 / 600					
†K II.. ..	Fijenoord	1919	172·3	16·8	12·5	..	550 / 600	1,800 / 600	15 / 8	1 3-in., 1 maxim	6 17·7″	29	—/76

* Dutch East Indian Fleet. † Indian Military Marine.
‡ To replace Hertzog Hendrik. Should be referred to as a cruiser, but is officially termed a flotilla leader.

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Norway.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Draug, Troll, Garm	Horten ..	1908–13	226	23·5	8·8	2	540	7,500 (Garm 8,000)	27·0	6 3-in. Draug has 6 4·7-in. in addition	3 18-in.	71	95 / 6
TORPEDO BOATS: FIRST CLASS—													
Snogg, Stegg, Trygg	Horten ..	1919–1920	173·9	18	5¼	2	250	3,500	25	2 3-in.	4	31	30 / —
Storm, Brand ..	Horten ..	1900	130·0	16·0	6·9	1	100	1,100	21	2 M.	2	19	17 / —
Laks, Slid, Sael, Skrei	Horten ..	1901	126·4	15·0	6·9	1	100	1,150	21·8	2 M.	2	19	17 / —
Sleipner, Aegir ..	Horten ..	Bldg.	236·3	25·5	6·9	..	560	12,500	30	3 4-in., 1 1·5-in. A.A.	2 18″ 4 21″	..	..
SECOND CLASS—													
* Kjek, Hvas, Kvik, Blink	Fredrikstad	1898	114·5	14·5	6·0	1	73	650–750	19–20	2 M.		14	11 / —
* Lyn, Hauk, Falk	Horten ..	1903											
Skarv, Teist	Horten ..	1906–7	133	14·5	6·5	1	100	1,600	25	2 3-pr.	2 18″	18	16 / —
Lom, Jo, Grib.. ..			117	14·5	5·7	1	72	1,100	23	2 M.		16	15 / —
Ravn, Orn	Horten ..	1903	113	14·5	5·7	1	73	850	23	2 M.		16	
Kjell	Horten ..	1912	135	14·9	6·4	1	100	1,800	25	2 3-pr.		19	15 / —
SUBMARINES—													
A 2, 3, 4	Germania Kiel	1909 to 1913	133·2	15·7	8·9	2	246 / 332	900 / 380	14 / 7	—	3 18″	17	— / 12·8
B 1, 2	Horten ..	1922	167·3	17·5	10·5	2	413 / 545	900 / 640	14·5 / 10	1 12-pr.	4 18″	23	— / 21
B 3, 4	Horten ..	1923–24											
B 5, 6	Horten ..	1929											

* Employed as patrol ships.

Soviet Union.

Some of the details given below are uncertain.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—													
Felix Dzerzhinski, Petrovski .., Nezamojni .., Shaumyan ..	Ship & Eng. Co., Nikolaev	1917	303·5	29·5	10·5	..	1326	29,000	33	4 4-in., 2 7-pr., 4 M., can carry 80 mines	12 18″ (T.)	120	— / 390
Karl Marx .., Kalinin	Revel.. ..	1915	344·5	31·3	9·7	..	1350	32,700	35	5 4-in., 1 3-in. A.A., carries mines	9 18″ (T.)	110	— / 400
Uritsky .. .., Volodarski .., Rykov .. .., Engels .. .., Stalin .. .., Artem .. .., Voikov .. .., Lenin	Leningrad..	1914	321·5	30·5	9·25	..	1610	32,000	35	4 4-in., 1 3-in. A.A., 2 M., 80 mines	9 18″ (T.)	110	— / 400
		1914–1915	314·75	30·5	9·75	..	1260	30,000	35			110	— / 350
Bezpokoini* .., Gnyevni* .., Derski*	Nikolaev ..	1913–14	307·7	29 5	9	..	1088	25,500	34	3 4-in., 2 3-pr., 4 M.	10 18″ (D.)	140	— / 260
Pospyeshni* .., Puilki*	Leningrad..	1913–14	321·5	30·5	9·8	..	1100	23,000	34	3 4-in., 2 3-pr., 4 M., 80 mines	10 18″ (D.)	120	— / 351
Frunze	Leningrad ..	1914	336	31·1	9·8	..	1100	23,000	34	4 4-in., 1 3-in., 4 M.	6 (D.)	120	— / 350
C CLASS GUARD SHIPS—													
Shtorm .. .. .., Shkval	.. ..	1932	..	..	..	..	470	..	29	2 5-ins., 2 4-in.	3	..	..

* Under French protection at Bizerta.

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Soviet Union—*continued.*

Name or Number.	Where Built.	Date of Completion.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement. Surf./Sub.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
SUBMARINES—													
B4 and 5													
Revoluzioner	Nikolaiev ..	1931	279	23	16½	..	896 / 1318	1500 / 1200	15 / 8	1 4-in. A.A.	8	..	..
Yakobinetz													
Spartakovetz	Sevastopol												
Dekabrist	..	1931	279	23	16½	..	1000 / —	1500 / 1200	16 / 10	1 4-in.	8	..	..
Narodvoletz													
Politrabotnik (*ex*-Ag 26)	..	1924	150¼	15¾	5¼	..	355 / 467	480 / 320	13 / 11	1 6-pr.	4	..	..
Marxist (*ex*-Ag 25)	..	1922											
Kommunist (*ex*-Ag 24)	..	1922	150¼	15¾	15¼	..	375 / 467	480 / 320	13 / 11	1 6-pr.	18″	..	..
Shakter (*ex*-Ag 23),	..	..											
Ag 22*	..	1920	..	..	..	..	..	..	13 / 7·5	1 4-in., 2 M.	6 / 18″	..	— / 17
Proletary	..	1916	223	14·5	12·5			2640 / 900	16 / 9	1 6-pr., or 2 6-pr., 1 M.	4	33	— / 40
Rabotchky	..	1917						2640 / 900	16 / 9	42 mines	4	..	
Tyulen*	..	1915	220	14·5	12·7			500 / 1400	10 / 11·7	1 4-in., 1 6-pr., 2 M.	4	52	— / 2
Politruk	..	1913											
Utka*	..	1916											
Burysevyestnik* ..	..	1918	223	14·5	12·5		650 / 784	500 / 900	10 / 9	2 11-pr., 1 1-pr., 1 M.	4	52	— / 40
Batrak	..	1917						2640 / 900	16 / 9	1 11-pr.	4	33	
Krasnoarmeyets ..	..	1917	223	14·5	12·6			2640 / 900	16 / 9	2 6-pr., 1 1-pr.	4	33	..
Komissar	..	1916											
Bolshevik	..	1916											
Komunar (*ex*-Tigr)	..	1916						500 / 900	10 / 9	2 6-pr., 1 1-pr., 1 M.	4	33	— / 40
Tovaristch	..	1916											
Krasnoflotetz ..	..	1916											
Bedryak		1916											
L55 (*ex*-British, raised from Baltic)	..	..	230 b.p.	23·5	13·2	..	900 / 1150	2400 / 1600	17·5 / 10·5	2 4-in. guns	6 / 21″	..	— / 78

In addition to the above about four other submarines are understood to be building or authorised. * Under French protection. There are about thirty-five destroyers and torpedo-boats completed from 1895 to 1912 of very little if any fighting value. Many of the above vessels are known to be practically useless until very extensively repaired and refitted.

Spain.

Name or Number.	Where Built.	Launched.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
FLOTILLA LEADERS—													
Gravina													
Escano													
Ciscar		1934											
Jorge Juan													
Ulloa													
Almirante Valdés ..		1930											
,, Antequera	Cartagena ..	1930	331¾	31·7	10·5	2	1,650	42,000	36	5 4·7-in., 13-in. A.A., 4 M.	6 21-in. (T.)	..	— / 540
,, Miranda		1931											
Churruca		1929											
Alcala Galiano ..		1930											
Lepanto		1928											
Almirante Ferrandiz		1928											
José Luis Diez ..		1928											
Sanchez-Barcaiztegui		1926											
DESTROYERS—													
Alsedo		1922											
Velasco	Cartagena ..	1923	283	27	9	2	1,145	33,000	34	3 4-in., 2 2-pr. A.A.	4 21-in. (D.)	70	— / 265
Juan Lazaga		1924											
Villaamil (Minelayer)	Cartagena ..	1913	221¼	22¼	7	..	539	6,250	28	5 6-pr.	4 18-in.	70	80 / —
TORPEDO BOATS—													
12 boats	Cartagena ..	1913–1922	164	16·5	4·9	3	187	3,750	26	3 3-pr.	3 18-in.	31	33 / —
SUBMARINES—													
D1	Cartagena ..	1934	276	21·8	..	..	1050 / 1375	5000 / 1350	20·5 / 9·5	1 4·7-in., 4 M.	6 21-in.	..	..
D2 & D3		1935											
C 2–6	Cartagena ..	1928–1929	240	20·8	13·5	..	900 / 1270	2000 / 750	16 / 8·5	1 4-in., 1 3-in. A.A.	6 21-in.	..	..
Isaac Peral (*ex*-C 1)													
B 1–6	Cartagena ..	1921–24	210	18·9	11·25	..	560 / 830	1400 / 850	16 / 10·5	..	4 18-in.	28	— / 66

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Sweden.

Name or Number.	Where Built.	Launched.	Dimensions. Length (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal / Oil
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Destroyers—													
Goteborg	Gothenburg	Bldg	..	..	..	..	895	32,000	39	3 5-in., 2 1·5-in.	6 21″		
Stockholm	Karlskrona												
Klas Horn	Malmo	1931	303·2	29·2	10·5	..	881	24,000–26,000	35	3 4·7-in., 2 2-prs. A.A., 2 M.	2 trpl. 21″	125	— / 150
Klas Uggla	Karlskrona												
Ehrensköld	Göteborg	1926											
Nordenskjold	Malmö												
Magne	Thornycroft	1905	216	20·8	9	2	354	8,000	30	6 6-prs.,	2 18″	..	80 / —
Wale..	Malmo ..	1906	216	20·8	9	2	354	8,000	30	2 3-in., 4 6-prs.	4 18″	..	
Ragnar†	Malmo ..	1909	216	20·8	9	2	354	8,000–9,000	30·0	4 3-in., 2 M.	4 18″ (D.)	67	80 / 3
Sigurd	Gothenburg	1909											
Vidar	Malmo ..	1909											
Hugin	Gothenburg	1909											
Munin	Malmo ..	1910											
Wrangel †	Gothenborg	1917	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6 18″	72	107 / 6
Wachtmeister ..													
Torpedo-Boats—													
1st Class—													
Castor‡, Pollux‡ ..	Normand & Karlskrona	1908	128	14·5	8·5	1	103	2,000	25	2 6-prs. (except Castor and Pollux which have 2 1-prs.)	2 18″ (‡)	18	20 / —
Vega‡	Karlskrona..	1910											
Vesta‡													
Spica, Astrea, Iris, Thetis	Bergsund and Gothenburg	1909											
Altair‡	Stockholm ..	1908											
Antares‡													
Argo‡													
Arcturus‡													
Perseus, Polaris ..	Bergsund ..	1910–1915											
Regulus, Rigel ..	Stockholm ..												
Submarines—													
1st Class—													
Ulven	Naval Yard, Karlskrona	1930	217	21	10·8	..	700 / 850	2800 / —	16 / 9	1 4-in., 1 M.	4 20-in.	32	— / 40
Draken		1926											
Gripen		1928											
Bavern	Naval Yard, Karlskrona	1921	187	18·5	9·2	..	500 / 650	2800 / —	15 / 9	1 3-in., 1 M.	4 18″	..	— / 33
Illern													
Uttern													
Svärdfisken	Kockum Co., Malmo	1914	137·7	12·5	9·8	..	300 / —	800 / —	15 / 9	1 6-pr.	2 18″	..	— / 8
Tumlaren													
Sälen	Kockum Co., Malmo	1920	177·2	16·2	11·2	..	450 / 580	..	..	1 3-in., 1 M.	4 18″	..	— / 23
Valrossen													
Hajen													
Minelaying Sub.—													
Valen	Karlskrona	1925	187·2	23·2	9·4	..	500	..	..	1 3-in., 1 M.	4 18″	..	— / 34
Nordkaparen	Malmo ..	1935	..	..	..	..	500 / 720	..	15 / 10	1 4-in.	4 21″	..	..
Delfinen													
Springaren													
Sjolejonet		Bldg.											
2nd Class—													
Aborren	Karlskrona D.Y.	1914–15	101·7	11·7	10·2	..	173	..	..	..	2 18″	..	— / 6·5
Braxen													
Laxen			88·6	11·7	10·2	..	133	..	..	..	1 18″	..	— / 4·0

† Fitted for mine-laying.

* Also six small 2nd class torpedo-boats, Nos. 5–9, 14 (60 tons, 20 knots, built 1907–1908), and two motor torpedo-boats, Nos. 3 and 4.

‡ Torpedo-boats marked ‡ have one 18-inch tube only.

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United States.

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
DESTROYERS—			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Davis	Bath, I.W. Co.	Bldg.											
Sampson ..													
Jouett													
Somers	Federal S.B. & D.D. Co.												
Warrington ..													
Porter	N.Y.S. Co., Camden	1936	372	32¼	10½	..	1850	..	..	5-in. guns	..	..	..
Selfridge ..													
McDougal ..		1936											
Winslow ..		1936											
Phelps	Bethlehem S.B. Co., Quincy												
Clark													
Moffett ..													
Balch													
DD418	Charterton N.Y.												
DD417	Norfolk N.Y.												
DD416	Boston N.Y.												
DD415													
DD414	Newport News												
DD413													
DD412	Federal S.B. & D.D. Co.												
DD411													
DD410	Bath, I.W. Co.												
DD409													
Wilson	Puget Sound												
Sterrett	Charterton N.Y.												
Stack	Norfolk N.Y.	Bldg.											
Rowan													
Rhind	Philadelphia N.Y.												
Trippe	Boston N.Y.												
Mayrant ..	Boston N.Y.												
Maury	Bethlehem S.B. Co.												
McCall													
Lang	Federal S.B. & D.D. Co.												
Ellet													
Benham ..													
Jarvis	Navy Yard, Puget Sound												
Patterson ..													
Henley	Navy Yard, Mare Is.		334 on W.L.	34¾	9¾	..	1500	..	..	5-in. guns	..	..	..
Ralph Talbot	Navy Yard, Boston												
Mugford ..													
Helm	Navy Yard, Norfolk												
Blue													
Bagley													
Fanning ..	United D.D. Co.												
Dunlop													
Craven	Bethlehem S.B. Co.												
Gridley													
Mahan	United D.D. Inc., N.Y.												
Cummings ..													
Drayton ..	Bath I.W. Co.												
Lamson ..													
Flusser ..	Federal S.B. & D.D. Co.	1936–1937											
Reid													
Case	Navy Yard, Boston												
Conyngham													
Cassin	Navy Yard, Philadelphia												
Shaw													
Tucker	Navy Yard, Norfolk												
Downes ..													
Cushing ..	Navy Yard, Puget Sound, Navy Yard Mare Is.												
Perkins ..													
Smith							1,395						
Preston ..													
Dale	Navy Yard, N.Y.						1,395						
Monaghan ..	Navy Yard, Boston	1935					1,375						
Aylwin ..	Navy Yard, Philadelphia						1,365	42,800	36½	5 5-in. A.A. 8 or 10 M.	8 21-in. (Q)	160	400
Farragut ..	Bethlehem S.B. Co.	1934	334	34¼	9¼	..	1,345						
Dewey	Bath, I.W.Co.						1,395						
Hull	Navy Yard, N.Y.						1,395						
MacDonough	Navy Yard, Boston	1935					1,410						
Worden ..	Navy Yard Puget Sound												

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United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
DESTROYERS—*continued.*													
Pruitt	Bath, I.W.	1920						25,000					
Sicard													
Preble ..		1920											
William B. Preston ..	Norfolk, N.W.	1920											
Noa		1921											
Hulbert ..		1920											
Decatur ..	Navy Yard, Mare Is.	1922						24,200					
Perry		1922											
Trever ..		1922											
Wasmuth ..		1921											
Zane		1921											
Litchfield ..		1920											
Meade ..	Bethlehem S.B. Co., Squantum												
Swasey ..													
Tingey ..													
Morris ..													
Thornton ..													
Bailey ..													
Shubrick ..													
Ballard ..													
Greene ..													
Edwards ..													
McLanahan													
Laub	Bethlehem S.B. Co., Quincy	1919						27,000					
Gillis													
Turner.. ..													
Aulick ..													
Welles ..													
Bancroft ..													
Osmond Ingram													
Rodgers ..			314·4	31	9·8	..	1,190		35	4 4-in., 1 3-in. A.A. (Kane, Fox, Brooks, and Hatfield have 4 5-in. guns.)	4 triple 21-in.	122	375
McCalla ..													
McCook ..													
Belknap ..		1919											
Lawrence ..	New York S.B. Co.	1921											
Hopkins ..		1921											
Barry ..		1920											
Goff		1921											
Bainbridge ..		1921											
Reuben James													
Williamson													
Sands													
King													
Childs													
Sturtevant ..													
Overton ..													
James K. Paulding		1920						26,000					
McFarland ..													
Humphreys													
Kane													
Fox													
Gilmer ..													
Brooks ..													
Hatfield ..													
Paul Jones	Cramp, Pa.												
Truxton ..		1921											
John D. Ford													
Pillsbury ..													
Peary													
Pope		1920											
Stewart ..	Cramp, Pa.	1920											
McCormick													
Bulmer ..													
Simpson ..													
MacLeish ..													
Edsall													
Parrott ..													
Whipple ..													
J. D. Edwards	Newport News S.B. Co.	1919											
Borie			314·4	31	9·8	..	1,190	26,000	35	4 4-in., 1 3-in. A.A. (Long and Hovey have 8 4-in. in twin mtgs. and 1 3-in. A.A.)	4 triple 21-in.	122	375
Tracy ..													
Barker ..													
Smith Thompson													
Alden ..													
Broome ..													
Long													
Hovey ..													
Southard ..													
Chandler ..													

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United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
DESTROYERS—*continued.*			Feet.	Feet.	Feet.		Tons.		Knots.				Tons.
Dallas													
*Herndon ..													
Branch ..		1920											
*George E. Badger													
*Welborn C. Wood		1921											
*Hunt		1920	314·4	31	9·8	..	1,190	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	375
*Abel P. Upshur	Newport News S.B. Co.	1920											
Mason ..		1920											
Satterlee ..		1919											
Goldsborough		1920											
Dahlgren ..													
Clemson ..		1919											
Bagley													
Abbot													
Haraden ..		1919	314·4	31	9·8	..	1,060	25,000	35	4 4-in., 1 3-in A.A.	4 triple. 21-in.	122	286
Thomas ..													
Hopewell ..													
Stansbury ..		1920											
Howard ..		1920											
Hogan ..													
O'Bannon ..	Union I.W.												
Renshaw ..													
Mackenzie ..													
Kalk													
Foote ..													
Maddox ..		1919	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Cowell ..													
Bush	Fore River S.B. Co.												
Meredith ..													
Crosby ..													
Walker ..													
Thatcher ..													
Palmer ..		1918											
Herbert ..													
Schenck ..	N.Y. S.B. Co.		314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Leary ..													
Dickerson ..													
J. Fred Talbot													
Cole													
Ellis													
Bernadou ..		1919											
Dupont ..													
Biddle ..													
Blakeley ..													
Barney ..	Cramp, Phil.		314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Breckenridge													
Roper													
Elliot ..													
Greer													
Upshur ..		1918											
Yarnall ..													
Tarbell ..													
Hamilton ..		1919											
Claxton ..		1919											
Ward	Mare Island, N.Y.	1918						24,200					
Kennison ..		1919											
†Kilty		1918	314·4	31	9·5	..	..		35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
†Boggs		1918											
Tillman ..		1921						26,000					
Crowninshield													
Hale	Bath I.W.	1919						24,200					
Aaron Ward													
Buchanan ..								26,000					
Jacob Jones													
Babbitt ..													
Twiggs ..	New York S.B. Co.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Badger ..													
Tattnall ..													
Radford	Newport News S. Co.	1919	314·4	31	9·8	..	{1060 1090}	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Lamberton ..													
Lea		1918											
Dorsey ..													
Dent													
Waters ..	Cramp, Pa.		314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A. (Rathburne has 3 4-in.)	4 triple 21-in.	122	286
Talbot ..													
Rathburne ..													

† Equipped as targets, wireless controlled. * Operated by the U.S. Coast Guard.

Destroyers Hazelwood, Stoddert and Sinclair are employed as target ships.

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United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Feet.	Feet.	Feet			Tons.	Knots.				Tons.
Destroyers— *continued.*													
Crane	Union Plant.	1919	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Williams ..		1919											
Chew													
No. 105, *ex*-Mugford													
Champlin ..		1918											
Schley ..													
Bell	Fore River S.B. Co.												
Taylor ..	Mare Island, N.Y.	1918	314·4	31	9·8	..	1,090	27,000 / 24,200	35	4 4-in., 1 3 in. A.A.	4 triple 21-in.	122	286
Fairfax ..													
No. 92, *ex*-Gridley	Union I.W.	1919	314·4	31	9·9	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
Harding ..		1919											
McKean ..		1919											
Ringgold ..		1918											
Robinson ..		1918											
McKee.. ..		1918											
Stevens ..	Fore River S.B. Co.		314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283
Colhoun ..													
Dyer													
Stringham ..													
Gregory ..													
Sigourney ..		1918											
Kimberly ..													
Little													
Evans	Bath I.W.		314·4	31	9·7	..	1,090	27,000 / 27,000 / 24,200	35	4 4-in., 1 3-in. A.A.	4 triple	122	286
Philip													
Wickes ..													
Manley ..		1917	315·5	30·7	9·5	..	1020	20,000	32	3 4-in., 1 3-in. A.A.	4 triple 21-in.	122	260
Stockton ..	Cramp Pa.	1917						18,500	30	5 4-in., 1 3-in. A.A.			
Conner ..		1918											
Gwin	Seattle D.D. Co.	1920						18,750	30	4 4-in., 1 3-in. A.A.			
No. 70, *ex*-Craven	Norfolk, N.Y.	1918						20,000	32	4 4-in., 1 3-in. A.A.			
Caldwell ..	Mare Island N.Y.	1917	315·5	30·7	9·5	..	1020	21,000	30	4 4-in., 1 3-in. A.A.			
Allen	Bath I.W.	1917	315·3	29·9	9·8	..	920	17,500	30	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	290
Rowan ..	Fore River S.B. Co.	1916	315·3	29·9	10·7	..	920	17,000	29·5	4 4-in., 1 3-in. A.A.			
Sampson ..													
Wadsworth..	Bath I.W.	1915	315·3	29·9	10	..	910	17,500	30	4 4-in.	4 dbl. 18-in.	118	310
†No. 55 *ex*-Cushing ..	Fore River S.B. Co.	1915	305·3	30·4	10·5	..	860	17,000	29	4 4-in. 1 3-in. A.A.	4 dbl. 18-in.	106	308
†No. 53 *ex*-Winslow ..		1915	305·3	30·3	10·5	..	860	17,000	29				
Nicholson ..													
O'Brien ..													
†No. 50 *ex*-Balch ..	Cramp.	1914	305·3	30·5	10·5	..	820	16,000	29·5	4 4-in. 1 3-in. A.A. (*ex*-Parker 4 4-in.)	4 dbl. 18-in.	106	310
Benham ..		1914											
Parker ..		1913											
†No. 47 *ex*-Aylwin ..		1914											
Duncan ..	Fore River S.B. Co.	1913	305·3	30·4	10	..	820	16,000	29				
†No. 45 *ex*-Downes ..	N.Y.S.B. Co.	1915	305·3	30·4	9·8	..	820	16,000	29	4 4-in.	4 dbl. 18-in.	104	306
†No. 44 *ex*-*Cummings	Bath I.W.	1913											
†No. 43 *ex*-*Cassin													
†No. 54 *ex*-*McDougal ..	Bath I.W.	1914	305·3	30·6	9·8	..	860	16,000	29·5	4 4-in.	4 dbl. 18-in.	104	311
*Ericsson ..	N.Y.S.B. Co.	1915	305·3	30·6	10·7	..	860	17,000	29				305
†No. 57 *ex*-*Tucker ..	Fore R.S.B.Co.	1916	305·3	29·9	10·3	..	910	17,000	29·5				309
†No. 58 *ex*-*Conyngham	Cramp.	1916	315·3	29·9	10·1	..	910	18,500	29·5				308
†No. 59 *ex*-*Porter ..	Cramp.	1916	315·3	29·9	10·1	..	910	18,000	29·5				308
*Wainwright ..	N.Y.S.B. Co.	1916	315·3	29·9	10·7	..	910	17,000	29·5				308
*Davis	Bath I.W.	1916	315·3	29·9	9·8	..	920	17,500	30	4 4-in. 2 3-in. A.A.	4 triple 21-in.	120	290
*Wilkes	Cramp.	1917	315·3	29·9	10·7	..	920	18,000	29·5				290
*Shaw	Mare I., N.Y.	1916	315·3	29·9	10·7	..	910	17,000	29·5				290

* Operated by the U.S. Coast Guard.

† These destroyers have been reverted to their numbers, and names have been taken for the 1933–1934 programme destroyers. They are being scrapped.

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United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement. Surface. / Submerged.	Horse-Power.	Maximum Speed. Surface. / Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel. Oil.
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
DESTROYERS NOW FITTED AS MINELAYERS—													
Sproston .. Anthony .. Ingraham .. Lansdale .. Luce .. .. Israel .. .. Murray .. Stribling ..	Union I.W. / Fore River S.B. Co.	1919 / 1918	314·4	30·5	9	2	1,160	27,000	35	4 4-in. 1 3-in. A.A. 92 mines	—	107	283
Lamsay .. Gamble .. Breese .. .. Montgomery	Newport News S. Co.	1918 / 1919	314·4	30.5	9	2	1,160	25,000	35	4 4-in. 1 3-in. A.A.	—	120	286
SUBMARINES—													
Perch .. .. Pickerel .. Permit .. Plunger .. Pollack .. Pompano ..	Electric Boat Co. / Portsmouth Navy Yard / Mare Island Navy Yard	Bldg.	290	25	14	..	1,330 / —	..	..	1 3-in.	6 21″	50	..
Salmon .. Seal .. .. Skipjack .. Snapper .. Stringray .. Sturgeon ..	Electric Boat Co. / Portsmouth Navy Yard / Mare Island Navy Yard	Bldg.	..	..	..	..	1,450 / —	..	..	..	..	..	..
S.S. 188 .. S.S. 189 .. S.S. 190 .. S.S. 191 .. S.S. 192 ..	Electric Boat Co. / Portsmouth Navy Yard	Bldg.											
Porpoise .. Pike	Portsmouth Navy Yard.	1936	283	24·9	13	..	1290 estd.	3,000	14	1 3-in.	6 21″	..	..
Shark .. Tarpon ..	Electric Boat Co.	1936	288	25·1	13·9	..	1320 estd.	..	..	1 3-in.			
V7 Dolphin	Portsmouth Navy Yard.	1932	307	27·8	13	..	1,540 / 2,215	4,250 / —	17 / 8	1 4-in.	6 21″	58	..
V8 Cachalot V9 Cuttlefish	Portsmouth Navy Yard / Electric Boat Co.	1934	260	24·8	13	..	1,110 / 1,650	3,100 / —	17 / 8	1 3-in. A.A.	6 21″	..	..
V4 Argonaut	Portsmouth Navy Yard.	1928	381	33·7	15 4	..	2,710 / 4,080	3,175 / —	15 / 8	2 6-in., 60 mines	4 21″	86	..
V5 Narwhal V6 Nautilus	Portsmouth Navy Yard. / Mare Island Navy Yard.	1930	371	33·3	16	..	2,730 / 3,960	5,450 / —	17 / 85	2 6-in.	6 21″	88	..
V3 Bonita .. V2 Bass .. V1 Barracuda	Portsmouth Navy Yard.	1926 1925 1924	341·5	27·5	15·5	..	2,000 / 2,506	6,700 / —	14 / 9	1 5-in. (Bass has 1 3-in. A.A.)	6 21″	87	..
S48	Lake T.B. Co., Bridgeport	1922	265·3	21·8	13·5	..	1,000 / 1,458	2,000 / 1,500	14·8 / 11·0	1 4-in.	5 21″	..	237
S47* .. .. S46* .. .. S45* .. .. S44* .. .. S43* S42*	Bethlehem Shipbuilding Corp., Quincy Plant	1925 1925 1925 1925 1924 1924	225·3	20·5	16	..	850 / 1,126	1,200 / 1,500	14 / 10	1 4-in.	4 12″	44	154
S41* .. .. S40* .. .. S39* .. .. S38* .. .. S37* .. .. S36* .. .. S35* .. .. S34* .. .. S33* .. .. S32* .. .. S31* .. .. S30* .. .	Bethlehem Shipbuilding Corp., Union Plant	1924 1923 1923 1923 1923 1923 1923 1923 1923 1923 1923 1923 1920	219·3	20·5	16	2	800 / 1,062	1,200 / 1,500	14·5 / 11	1 4-in.	4 21″	42	140

* Designed by Electric Boat Co., Groton, Conn.

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United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions. Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement. Surface. / Submerged.	Horse-Power.	Maximum Speed. Surface. / Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel Capacity.
			Feet.	Feet.	Feet.		Tons.		Knots				Tons.
SUBMARINES—*continued.*													
S29*	Bethlehem Shipbuilding Corp., Quincy Plant	1924	219·3	20·5	16	2	800 / 1,062	1,200 / 1,500	14·5 / 11	1 4-in.	4 21"	42	140
S28*		1923											
S27*		1924											
S26*		1923											
S25*		1923											
S24*		1923											
S23*		1923											
S22*		1924											
S21*		1923											
S20*		1922											
S19*		1921											
S18*		1923											
S17	Lake T.B. Co., Bridgeport	1921	231	21·5	13	..	790 / 1,092	2,000 / 1,200	15·25 / 9	1 4-in.	4 21"	38	123
S16		1920											
S15		1921											
S14		1921											
S13	Navy Yard, Portsmouth	1923	231	21·8	13	..	790 / 1.092	2,000 / 1,200	14·75 / 9	1 4-in.	5 21"	38	123
S12		1923											
S11		1923											
S10		1922											
S9		1921	231	21·8	13	..	790 / 1,092	1,400 / 1,200	14 / 9	1 4-in.	4 21"	38	123
S8		1920											
S7		1920											
S6		1920											
S4†		1919											
S3		1919											
S1*	Fore River S.B. Co.	1920	219·3	20·7	16	..	800 / 1,062	1 200 / 1,500	14·5 / 11	1 4-in., 1 aeroplane	4 21"	38	140
R20*	Union I.W.	1918	186·1	18	14·5	2	530 / 680	880 / 931	13·5 / 10·5	1 3-in.	4 21"	30	63
R19*													
R18*													
R17*													
R16*													
R15*													
R14*	Fore River S.B. Co.	1919											
R13*													
R12*													
R11*													
R10*													
R9*													
R8*													
R7*													
R6*													
R5*													
R4*													
R3*													
R2*													
R1*													
O10*§ ..	Fore River S.B. Co.	1918	172·3	18	14·4	2	480 / 629	880 / 740	14 / 10·5	1 3-in.	4 21"	30	73
O9*§													
O8*§													
O7*§													
O6*§													
O4*§													
O3*§													
O2*§													
O1*§													

* Designed by Electric Boat Co., Groton, Conn. † Used for salvage operations. Has no guns or torpedo tubes.

§ To be disposed of shortly.

The machinery contractors for the vessels of the E. B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn., and the hulls were built under sub-contract from the E. B. Co.

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TABLES OF COMPARATIVE NAVAL STRENGTH

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TABLE I.—EFFECTIVE FIGHTING SHIPS, BUILT, BUILDING, AND PROJECTED.

Class.	British Empire.			U.S.A.			Japan.			France.			Italy.			Soviet Union.			Germany.		
	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.	Built.	Building.	Projected.
Battleships { 14-in. guns and upwards	12	2	3	14	—	2	9	—	2	—	2	—	—	2	—	—	No details available.		—	2	—
Battleships { Below 14-in. guns	—	—	—	1	—	—	—	—	—	†9	2	—	4	—	—	4			5	2	—
Battle-cruisers	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			—	—	—
Cruisers	55	16	7	26	11	—	34 (*e*)	3	—	17	4	2	28	2	—	5			6	3	—
Cruiser Minelayers	1	—	—	—	—	—	5	1	—	1	—	—	—	—	—	2			—	—	—
Minelayers	4	1	—	—	—	—	—	—	—	2	—	—	—	—	—	—			—	—	—
Armoured Coast Defence Vessels, Monitors, and Netlayers	3 (*a*)	1 (*i*)	—	1	—	—	—	—	—	1	—	—	—	—	—	—			—	—	—
Aircraft Carriers	8 (*b*)	3	2	4	3	—	6 (*f*)	4 (*k*)	1	2 (*g*)	—	—	1 (*l*)	—	—	—			—	2	—
Flotilla Leaders and Destroyers	153	34	—	178 (*c*)	60	—	107	9	—	57	8	—	101	14	—	19			12 (*h*)	22	—
Torpedo Boats	—	—	—	—	—	—	13	—	—	16	—	—	2	—	—	—			7	12	—
Submarines	51	14	—	79	17	—	66	6	—	82	7	7	65	17	—	23			31	5	—
Sloops	43	6	—	—	—	—	—	—	—	10	—	—	26	1	—	4			—	—	—
Coastal Motor Boats	6	7	—	—	—	—	—	—	—	8	—	—	36	1	—	—			37	5	—
Gunboats and Despatch Vessels	—	—	—	9	2	—	4	—	—	32	4	4	6	4	—	2			7	—	—
River Gunboats	18	1	—	8	—	—	7	—	—	11	1	—	2	—	—	—			—	—	—
Minesweepers	31	10	—	43 (*d*)	—	—	12	2	—	20	8	—	48	—	—	6			27	—	—
Fleet Escorts	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			—	10	—

NOTES:—

(*a*) Includes 1 netlayer.
(*b*) Including 2 seaplane carriers one of which is not regarded as part of the War Fleet.
(*c*) Includes 12 fitted as minelayers.
(*d*) Includes 6 fitted as submarine rescue vessels.
(*e*) There are also 7 old cruisers classed as Coast Defence or Special Service Vessels.
(*f*) Includes 2 seaplane carriers.
(*g*) Includes 1 aviation transport.
(*h*) Classed in Germany as large torpedo boats.
(*i*) Netlayer.
(*k*) Includes 2 seaplane carriers.
(*l*) Seaplane carrier "Miraglia."
† Three vessels (Diderot, Condorcet and Voltaire) completed in 1911 are to be scrapped.

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TABLE II.—BATTLESHIPS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.
		tons.			tons.			tons.						tons.						
1927	Nelson	33,500	1923	Colorado	32,500	1921	Mutsu ...	32,720		*Building.*			*Building.*						*Building.*	
1927	Rodney	33,900	1923	West Virginia	31,800	1920	Nagato ...													
1916	Malaya		1921	Maryland ...	31,500	1918	Hyuga ...	29,990		*Richelieu*	35,000		*Vittorio*						2 *Battle-*	35,000
1916	Valiant		1920	Tennessee ...	32,300	1917	Ise			*Jean Bart*			*Veneto*	35,000					*ships*	
1915	Barham	31,100	1921	California ...	32,600	1917	Yamashiro	29,330					*Littorio* ...							
1915	Queen Elizabeth		1919	Idaho	33,400	1915	Fuso													
1915	Warspite		1918	New Mexico ...	33,400	1915	Kirishima													
1916	Royal Sovereign		1917	Mississippi ...	33,000	1915	Haruna ...	29,330												
1916	Royal Oak ...		1916	Arizona	32,600	1913	Kongo ...													
1916	Revenge ...	29,150	1916	Pennsylvania ...	33,100															
1916	Resolution ...		1916	Oklahoma ...	29,000															
1917	Ramillies ...		1916	Nevada	29,000															
			1914	Texas																
			1914	New York ...	27,000															
	Building.																			
	King George V.	35,000																		
	Prince of Wales																			
	*																			
	14 ships, including 2 building	438,650		14 ships.†	438,200		9 ships †	272,070		2 ships building	70,000		2 ships building	70,000					2 ships building	70,000

* 3 further battleships are to be laid down in 1937.

† It is reported that U.S.A. and Japan will lay down 2 battleships in 1937.

TABLE III.—BATTLE-CRUISERS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standar Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.
		tons.						tons.												
1920	Hood...	42,100																		
1916	Renown	32,000																		
1916	Repulse																			
	3 ships.	106,100																		

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TABLE IV.—BATTLESHIPS WITH GUNS BELOW 14-IN.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Standard Displacement.	Completed.	Name.	Normal Displacement.	Completed.	Name.	Normal Displacement.
					tons.						tons.			tons.			tons.			tons.
			1912	Arkansas	26,100				1915	Bretagne		1916	Andrea Doria	21,555	1914	Marat ...	23,606	1936	Admiral Graf Spee	
									1916	Lorraine...		1915	Caio Duilio ...		1914	October Revolution	23,256	1934	Admiral Scheer	10,000
									1916	Provence	22,189	1915	Conte di Cavour	21,604				1933	Deutschland	
									1913	Courbet ...		1914	Giulio Cesare	21,818	1914	Paris Commune	23,016			
									1913	Océan ...						Mikhail Frunze	—	1907	Hannover	
									1914	Paris ..								1908	Schleswig-Holstein	13,040
									1911	Diderot†...								1908	Schlesien	
									1911	Condorcet†	17,597									
									1911	Voltaire†										
									1937	Dunkerque	26,500									
										Building:—									*Building:—*	
										Strasbourg	26,500								*Scharnhorst*	26,000
																			Gneisenau	
				1 ship.	26,100					11 ships, including 1 building	238,925		4 ships.	86,532		3 ships.	69,878		8 ships, including 2 building	121,120

† These vessels are to be scrapped.

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TABLE VI.—CRUISERS.

NOTE.—Vessels under construction in italics. Cruisers marked * have guns above 6·1-in.

BRITISH EMPIRE.

Speed.	Name.	Standard Displacement.
kts.		tons.
32½	London * ...	9,750
32½	Devonshire *	
32½	Shropshire *...	9,730
32½	Sussex * ...	
31½	Berwick * ...	9,750
31½	Cornwall * ...	9,750
31½	Kent *	9,850
31½	Suffolk * ...	10,000
31½	Cumberland *	10,000
31½	Australia (A) *	9,870
31½	Canberra (A) *	9,850
33	Emerald ..	7,550
33	Enterprise ...	7,580
30½	Effingham ...	9,770
30½	Frobisher ...	9,860
29½	Hawkins ...	9,800
29	Despatch ...	
29	Diomede (N.Z.)	
29	Durban	
29	Delhi	4,850
29	Dunedin (N.Z.)	
29	Danae	
29	Dauntless ...	
29	Dragon	
29	Capetown ...	
29	Cairo	
29	Calcutta	4,200
29	Carlisle	
29	Colombo... ...	
29	Cardiff	
29	Coventry ..	
29	Curlew	4,290
29	Ceres	
29	Curacoa	
29	Caledon	
29	Calypso	4,180
29	Caradoc ...	

UNITED STATES.

Speed.	Name.	Standard Displacement.
kts.		tons.
	Omaha ...	
	Milwaukee	
	Cincinnati ...	
	Raleigh ...	
33·7	Detroit ...	7,050
	Richmond ...	
	Concord ...	
	Trenton ...	
	Marblehead	
	Memphis ...	
21	Salt Lake City * ...	9,100
32½	Pensacola *	
32½	Northampton * ...	9,050
32	Chester * ...	9,200
	Louisville *	9,050
	Chicago * ...	9,300
32½	Houston * ...	9,050
	Augusta * ...	9,050
	Portland * ...	9,800
	Indianapolis * ...	
	New Orleans *	
32·7	Astoria * ...	9,950
	Minneapolis*	
	Tuscaloosa *	
	San Francisco*	9,975 (estimated)
	Quincy * ...	
	Vincennes *	
	Savannah ...	9,950
	Nashville ...	
	Brooklyn ...	10,000
	Philadelphia	

JAPAN.

Speed.	Name.	Standard Displacement.
kts.		tons.
33	Nachi * ..	
33	Myoko * ..	
33	Ashigara *...	10,000
33	Haguro * ...	
33	Kako * ..	
33	Furutaka *	
33	Kinugasa *	7,100
33	Aoba * ...	
33	Naka	
33	Sendai ..	5,195
33	Jintzu ...	
33	Nagara ...	
33	Kinu	
33	Abukuma...	
33	Natori .	5,170
33	Isudzu ...	
33	Yura	
33	Kuma... ...	
33	Tama	
33	Kitakami ...	5,100
33	Kiso	
33	Oi	
33	Yubari ...	2,890
31	Tenryu ..	3,230
31	Tatsuta ..	
26	Yahagi ...	4,400
26	Hirado ..	
33	Takao * ...	
33	Atago * ..	9,850
33	Chokai * ...	
33	Maya * ...	
	Mogami ...	
	Mikuma ..	8,500
33	Suzuya ...	
33		
—	*Kumano* ...	8,500
	Tone	
	Tikuma ..	8,450

FRANCE.

Speed.	Name.	Standard Displacement.
kts.		tons.
33·2	Tourville * ..	10,000
	Duquesne * ...	
31·3	Suffren *	10,000
33	Duguay-Trouin	7,249
33	La Motte Picquet	
33	Primauguet ...	
34	Emile Bertin ...	5,886
21·4	Waldeck Rousseau *	12,617
	Ernest Renan *	12,234
	Jules Michelet *	11,072
22·8	Colbert *	
32	Foch *	10,000
32	Dupleix	
32	Jeanne d'Arc ...	6,496
26		
	Algerie *	10,000
31	La Galissonnière	
31	Jean de Vienne	
31	*Gloire*	7,600
31	*Marseillaise* ...	
31	*Montcalm*	
31	*Georges Leygues*	

ITALY.

Speed.	Name.	Standard Displacement.
kts.		tons.
35	Trento * ...	10,000
35	Trieste *...	
27	Taranto	3,184
28	Quarto	2,903
27½	Ancona	3,838
27½	Bari	3,248
27	Brindisi	2,756
27	Venezia	
22	Libia...	3,700
22½	San Giorgio * ...	9,232
23	San Marco * ...	9,350
27½	Pisa *	8,760
19	F. Ferruccio ...	6,299
37	Alberto da Guissano	
37	Alberico di Barbiano	5,069
37	Bartolomeo Colleoni	
37	Giov. della Bande Nere	
32	Zara *	10,000
32	Fiume *	
32	Gorizia *	10,000
37	Armando Diaz	5,008
37	Luigi Cadorna	
32	Pola *	10,000
35	Bolzano * ...	10,000
37	Attendolo .	6,941
37	Montecuccoli ...	
36½	E. Filliberto ...	7,283
36·5	E. di Savoia ...	
35	*Guiseppe Garibaldi*	7,874
35	*Duca degli Abruzzi*	

SOVIET UNION.

Speed.	Name.	Normal Displacement.
kts.		tons.
29	Profintern ...	6,600
	Chervonaya-Ukrainia	6,934
16	Komintern †	6,338
18	Aurora ...	5,622
	Krasni * Kavkas ...	8,030

GERMANY.

Speed.	Name.	Standard Displacement.
kts.		tons.
29	Emden ...	5,400
32	Königsberg	
32	Karlsruhe ...	
32	Köln ...	6,000
32	Leipzig ...	
32	Nürnberg ...	
	*J**	10,000
	*G**	10,000
	*H**	10,000

(A) Australian Navy. (N.Z.) New Zealand Navy. † Under French protection at Bizerta (disarmed). ‡ Listed for disposal.

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TABLE VI.—CRUISERS (*continued*).

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Standard Displacement.	Speed.	Name.	Normal Displacement.	Speed.	Name.	Displacement.
kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.	kts.		tons.
25½	Adelaide (A)...	5,100		*Wichita*	10,000															
32½	Norfolk* ..	9,850		*Phœnix*																
32½	Dorsetshire* ...	9,900		*Boise*																
32½	York*	8,250		*Honolulu* ...																
32	Exeter*	8,390		*St. Louis*... ...																
32½	Leander	7,140		*Helena*																
32½	Achilles	7,030																		
32½	Neptune ...	7,030																		
	Orion	7,070																		
	Ajax	6,840																		
	Sydney (A) ...	6,830																		
32½	Arethusa ...	5,220																		
32½	Galatea	5,220																		
32½	Amphion ..	7,040																		
32½	Apollo	6,980																		
32½	Penelope ..	5,270																		
32½	*Aurora*	5,200																		
32	*Southampton*	9,000																		
	Newcastle ...																			
	Glasgow... ...																			
	Sheffield																			
	Birmingham																			
	Liverpool ..																			
	Manchester ..	9,300																		
	Gloucester ...																			
	Belfast	10,000																		
	Edinburgh ...																			
	Dido	5,000																		
	Euryalus ...																			
	Naiad																			
	Phœbe																			
	Sirius																			
		482,700			332,925			249,005			185,652			200,514			33,524			65,400
† 69 ships, including 16 building.			37 ships, including 11 building.			37 ships, including 3 building.			‡ 21 ships, inlcuding 4 building.			30 ships, including 2 building.			5 ships.			9 ships, including 3 building.		

(A) Australian Navy.

† One cruiser minelayer (Adventure, 6,740 tons) in addition. Seven further cruisers are to be laid down in 1937.

‡ To this French cruiser tonnage must be added 32 vessels of an average displacement of 2,432 tons built and building. These vessels are classed in France (as France did not ratify the London Naval Treaty) as contre-torpilleurs; but being of a displacement of over 1,850 tons they automatically fall under the category of cruisers in lists of Fleets compiled by those Powers which ratified that Treaty.

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TABLE VII.—AIRCRAFT AND SEAPLANE CARRIERS.

BRITISH EMPIRE.			UNITED STATES.			JAPAN.			FRANCE.			ITALY.			SOVIET UNION.			GERMANY.		
Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.	Launched.	Name.	Standard Displacement.
		tons.			tons.			tons.			tons.			tons.						
1916	Furious *	22,450	1912	Langley** ...	11,500	1920	Notoro ‡	14,050	1914	Béarn † ...	22,146	1923	Miraglia‡‡	4,960					2 *building*	19,000
1917	Argus ...	14,450	1925	Lexington *...	33,000	1922	Kamoi ‡	17,000	1929	Commandant Teste ††	10,000									
1917	Pegasus ‖	6,900	1925	Saratoga * ...		1921	Hosho ...	7,470												
1914	Hermes ...	10,850				1925	Akagi *	26,900												
1919	Eagle † *	22,600	1933	Ranger ...	14,500	1921	Kaga †	26,900												
1918	Courageous	22,500				1931	Ryujo	7,100												
1928	Albatross (A)	4,800		*Yorktown* ...	19,900															
				Enterprise ...			*Hiryu* ..	10,050												
1916	Glorious *	22,500		*Wasp*	14,700		*Soryu* ...													
							Chitose ‖	10,000												
	Ark Royal	22,000					*Chioda* ‖													
	Illustrious																			
	Victorious																			
	§ 9 ships. including Ark Royal building, but not including Illustrious and Victorious.	149,050		7 ships. including 3 building.	146,500		10 ships. including 4 building	129,470		2 ships.	32,146		1 ship.	4,960		Nil	—		2 vessels building	38,000

* Completed as battle-cruisers 1917; converted to aircraft-carriers under the Washington Treaty.
† Designed as battleships
‖ Seaplane carrier, used for experimental work. Not counted as part of the war fleet, under the terms of the London Naval Treaty.
** Converted from collier Jupiter in 1921.
†† Aviation transport, a special type under the terms of London Naval Treaty.
§ 2 further aircraft carriers are to be laid down in 1937.
‡ Seaplane carriers converted from oilers.
(A) Seaplane carrier, Australian Navy.
‡‡ Seaplane carrier.

NOTE.—Vessels of which the names are printed in italics are under construction.

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BRITISH AND FOREIGN AIRCRAFT TYPES

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BRITISH NAVAL AIRCRAFT TYPES.

Fleet Air Arm.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P., Make.	Max. speed, m.p.h.	Ceiling, in feet.
Hawker Nimrod.	Single-seater Fighter. Float or Ship Plane.	480 Rolls-Royce "Kestrel."	192·5	26,900
Hawker Osprey.	Two-seater Fighter. Reconnaissance.	525 Rolls-Royce "Kestrel."	174·5	22,850
Fairey Seal.	Fleet Spotter Reconnaissance. 2–3 seater.	525 Armstrong-Siddeley "Panther."	140	17,000
Fairey Seal.	Fleet Spotter Reconnaissance. 2–3 seater. Seaplane.	525 Armstrong-Siddeley "Panther."	128·7	13,900
Blackburn Shark.	Torpedo Spotter Reconnaissance. Three-seater.	720 Armstrong-Siddeley "Tiger."	(Details not available.)	
Fairey Swordfish.	Torpedo Spotter Reconnaissance. Three-seater.	720 Armstrong-Siddeley "Tiger."	(Details not available.)	
Supermarine Walrus.	Fleet Spotter Reconnaissance. Three-seater.	587 Bristol "Pegasus"	123	—

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R.A.F. Shore-Based Aircraft which may be Employed in Co-operation with Naval Forces.*

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling, in feet.
Vickers Vildebeest.	Torpedo-Bomber. Two-seater.	587 Bristol "Pegasus."	141	16,250
Supermarine Scapa.	Reconnaissance Flying Boat. Five-seater.	Two 525 Rolls-Royce "Kestrel."	143	14,950
Short Singapore III.	Reconnaissance Flying Boat. Five-seater.	Four 525 Rolls-Royce "Kestrel."	136	13,600
Saunders-Roe London.	Reconnaissance Flying Boat. Five-seater.	Two 587 Bristol "Pegasus."	135	14,700
Supermarine Stranraer.	Reconnaissance Flying Boat. Six-seater.	Two 870 Bristol "Pegasus" X.	161	18,500
Avro Anson.	General Reconnaissance. Four-seater.	Two 310 "Cheetah" IX.	188	19,500

* Aircraft from the Bomber and Fighter Commands of the Metropolitan Air Force are also occasionally employed in Combined Exercises.

Aircraft Endurance.

Hawker Nimrod, 3¼ hours at 114 m.p.h.; Hawker Osprey, 4½ hours at 107 m.p.h.; Fairey Seal, 4½ hours at 103 m.p.h.; Supermarine Walrus, 4½ hours at 95 m.p.h.

Short Singapore III, 8½ hours at 100 m.p.h.; Supermarine Scapa, 10¼ hours at 102 m.p.h.; Saunders-Roe London, 10 hours at 98 m.p.h.; Supermarine Stranraer, 10¼ hours at 98 m.p.h.

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FOREIGN NAVAL AIRCRAFT TYPES.

United States Naval Air Service.

Aircraft, Heavier-than-Air.

Maker, Number, Name,	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling (Service), in feet.
Boeing. F4B-4.	Single-seater Fighter.	500 "Wasp."	187	27,500
Curtiss. F11C-3.	Single-seater Fighter.	700 "Cyclone."	233	—
Curtiss. BF2-C1.	Single-seater Bomber Fighter.	"Cyclone."	244	25,800
Grumman. FF-1.	Two-seater Fighter.	700 "Cyclone."	222	—
Douglas. PD-1.	Coastal Patrol Flying Boat. Crew of 4.	Two 525 "Cyclone."	121	11,600
Douglas. P2D-1.	Torpedo Bomber and G.P. Seaplane. Three-seater.	Two 575 "Cyclone."	135	11,950
Consolidated. P2Y-1.	Patrol Flying Boat. Crew of 5.	Two 600 "Cyclone."	130	—
Martin. BM-2. Diving Bomber.	High performance Bomber. Two-seater.	575 "Hornet."	143	15,100
Vought. 03U-4. "Corsair."	Two-seater land, sea, or Amphib. Observation.	500 "Wasp."	—	—
Grumman. F2F-1.	Single-seater Fighter, Dive Bomber.	750 "Cyclone."	250	26,000
Vought. SBU-1.	Two-seater Scout Bomber.	700 "Twin-Wasp."	Over 200 (stated).	—
Great Lakes. BG-1.	Two-seater Dive Bomber.	500 "Twin-Wasp."	180	23,800
Consolidated. PB7-1.	Patrol Flying Boat. Crew of 8.	Two 1000 "Twin-Wasp."	Over 170	—
Grumman. F3F-1.	Single-seater Fighter.	750 "Twin-Wasp."	240	28,000
Curtiss. SOC-1.	Two-seater Scout. Observation.	550 "Twin-Wasp."	160	—
Consolidated. P27-3.	Patrol Flying Boat. Crew of 5.	Two 675 "Cyclone."	161	—
Martin. P3M-1.	Patrol Flying Boat. Crew of 5.	Two 525 "Hornet."	115	12,050

All engines are air-cooled. "Wasp" and "Hornet" engines are made by Pratt and Whitney. "Whirlwind" and "Cyclone" engines are made by Curtiss-Wright.

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United States—*continued.*

BASES.

The United States have the following naval flying bases on shore :—

Pensacola, Florida (Training) ;
San Diego, California (Fleet Base and Marines) ;
Hampton Roads, Virginia (Fleet Base) ;
Lakehurst, New Jersey (Lighter-than-air craft) ;
Pearl Harbour, Hawaii (Fleet Base) ;
Coco-Solo, Canal Zone (Fleet Base) ;
Anacostia, D.C. (Experimental) ;
Seattle, Washington (Reserve Training Base) ;
Squantum, Mass. (Reserve Training Base) ;
Floyd Bennet Field, Brooklyn (Reserve Training Base) ;
Philadelphia (Reserve Training Base) ;
Norfolk, Va. (Reserve Training Base) ;
Miami, Fla. (Reserve Training Base) ;
Great Lakes, Ill. (Reserve Training Base) ;
Grosse Ile, Mich. (Reserve Training Base) ;
Minneapolis, Minn. (Reserve Training Base) ;
St. Louis, Mo. (Reserve Training Base) ;
Kansas City, Kansas (Reserve Training Base) ;
Long Beach, Calif. (Reserve Training Base) ;
Oakland, Calif. (Reserve Training Base) ;
Quantice, Va. (Fleet Marine Base) ;
St. Thomas, V.I. (Fleet Marine Base).

AIRCRAFT, LIGHTER-THAN-AIR.

The "Los Angeles" (LZ–126) was built by Zeppelin Co., of Friedrichshafen, and flown across the Atlantic (October, 1924) by a German crew for delivery to the United States. This airship has now been decommissioned. The ZMC–2 was manufactured by the Aircraft Development Corporation, and delivered to the U.S. Navy in September, 1929. She is used at Lakehurst for training.

The "Macon" (ZRS–5), built by the Goodyear Zeppelin Corporation, was delivered to the U.S. Navy in the summer of 1933, and was lost at sea in February, 1935. The "Akron" (ZRS–4), similar to the "Macon," was lost at sea in April, 1933. In addition to the ZMC–2, there are three non-rigid airships, K–1, J–4, and G–1.

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Japanese Naval Air Service.

Type.	Crew.	Engine and H.P.	Weight, lbs.	Speed, m.p.h.
Fighter.				
Nakajima 90.	1	Jupiter, 450	2,200	193
Reconnaissance.				
Navy 14–II. . . .	3	Lorraine, 450	6,050	111
Navy 15	2	Hispano, 300	4,290	114
Navy 90–II.	2	Jupiter, 450	3,888	—
Navy 90–III.	3	Jupiter, 450	6,750	—
Navy 94	3	Navy Type 91, 500	5,500	—
Bomber.				
Navy 13	3	Napier, 450	6,270	125
Navy 89	3	Hispano, 650	6,750	—
Navy 92	3	Hiro, 650	6,700	150
Flying Boat.				
Navy 15	4	2 Lorraine, 450	12,815	89
Navy 90–I.	6	3 Hispano, 700	26,400	137
Short 90–II.	6	3 Rolls-Royce, 800	28,600	137

The Hawker "Nimrod" single-seater fighter has been tested and the construction licence purchased from England.

*Lighter-than-air craft are based on Kasumigaura. There is one airship built in Japan in 1929 which is reported to be of 7,000 cubic metres capacity and 250 feet long. They also have two "Blimps."

* Believed to be in process of being dismantled.

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French Naval Air Service.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling, Endurance in hours.
Breguet "Bizerte" Flying Boat.	Long Reconnaissance 5–6	Three 650 "Gnome-Rhone."	130	24,000 10
Breguet "Calcutta" Flying Boat.	Long Reconnaissance 5	Three 450 "Gnome-Rhone."	110	16,000 9
C.A.M.S. 37 Flying Boat.	Short Reconnaissance 3	600 "Hispano."	108	14,760 5
C.A.M.S. 55 Flying Boat.	Long Reconnaissance 3–5	Two 600 "Hispano."	130	14,700 7
L.E.O.-S.A.F. 371 "Dewoitine" Landplane.	Single-seater Fighter (for Aircraft Carrier "Bearn.")	690 "Gnome-Rhone."	236	36,000 2
Gourdou-Lesseure 810 Float Seaplane.	Spotter Reconnaissance 2	450 "Gnome-Rhone."	120	16,500 5
Latécoère 302 "Croix du Sud" Flying Boat.	Long Reconnaissance 4	Four 650 "Hispano."	130	15,000 10
Latécoère 29 Float Seaplane.	Torpedo Bomber 3	650 "Hispano."	129	15,500 4
Latécoère 382 Flying Boat.	Long Reconnaisance	Two 650 "Hispano."	125	15,400
L.E.O. 25 Float Seaplane.	Bomber 4	Two 500 "Hispano."	155	21,000 4½
Levasseur P.L.7 Landplane.	Bomber 2–3 seater (marine type, can alight on water.)	600 "Hispano."	108	14,000 5
Levasseur P.L.15 Float Seaplane.	Bomber 2	600 "Hispano."	125	14,000 4
Lioré-Nieuport 70 "Loire" Flying Boat.	Long Reconnaissance 5	Three 500 "Hispano."	130	19,864 9

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French Naval Air Service—*continued*

BASES.

The bases and aerodromes of the Naval Air Service are as follows:—

1st Region (Cherbourg)—
Chantereyne (Sqdns. 1T1 and 1B1, Seaplanes; E2 and 1S1 Flying Boats).

2nd Region (Brest)—
Lanion (Sqdns. 2S1, E4 and E6, Flying Boats);
Brest (Captive Balloons);
Rochefort (Training);
Hourtin (Training).

3rd Region (Toulon)—
St. Raphael (Experimental and Sqdn. E5 Flying Boats);
Berre (Sqdns. 3B1, 3B2, 4T1, Seaplanes, E1 and E3, Flying Boats);
Hyères (Squadrons 7C2 Landplanes; 3S1, Flying Boats).

4th Region (Bizerta)—
Karouba (Sqdns. 4B1, 4B2, 4B3, Seaplanes; E7, 4S1, Flying Boats);
Bizerta (Captive Balloons).

AIRCRAFT, LIGHTER-THAN-AIR.

Lighter-than-air craft activities received a severe set-back when the "Dixmude" (ex-German L27) was lost with all hands off the coast of Sicily on December 20, 1923. The French Navy is now developing two classes of airship, the "Vedettes" and the "Escorteurs." The "Vedettes," of which there are nine, are of about 125,000 cubic feet capacity, speed of about 40 m.p.h., a crew of four, and endurances varying from 15 to 25 hours. The "Escorteurs," of which there are four, are of about 350,000 cubic feet, have a speed of about 40 m.p.h., a crew of six, and an endurance of about 40 hours.

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Italian Naval Air Service.

Maker, Name, Number.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling. Endurance in hours.
Piaggio P6ter. Floatplane.	Two-seater Reconnaissance.	410 "Fiat" A20.	121	11,650 5
Fiat. CR20. Floatplane.	Single-seater Fighter. All metal.	410 "Fiat" A20.	159	18,470 3
Savoia. S59bis. Flying Boat.	Two-seater Reconnaissance.	500 "Isotta Fraschini" (Asso.).	130	14,000 4
Savoia. S55. Monoplane. Flying Boat.	Five-seater Twin Hull Reconnaissance or Bomber.	Two 500 "Isotta Fraschini."	118	9,200 4
Macchi. M18. Flying Boat.	Two-seater Reconnaissance.	200–250 "Isotta Fraschini."	107	12,500 4
Cant 25. Flying Boat.	Single-seater Fighter.	410 "Fiat" A20.	150	18,000 4
M.F.4. Flying Boat.	Three-seater Reconnaissance Monoplane.	610 Stella IX R.	121	14,500 6
Savoia. S78. Flying Boat.	Two-seater Reconnaissance Bomber.	800 "Isotta Fraschini."	152	14,000
Cant. Z501. Flying Boat.	Four-seater Reconnaissance Bomber.	850 "Isotta Fraschini."	149	18,000

The wearing of parachutes of the "Salvator" type is compulsory for all occupants of Service Aircraft. Nearly all aircraft carry W/T transmitting and receiving sets, and a few are fitted with R/T. Italy's ship-borne aircraft are chiefly flying boats and are of various types, including the Cant 25, the M.F.4, and the Macchi M.18.

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BRITISH AND FOREIGN ORDNANCE TABLES

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VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

Tables Corrected by the Manufacturers, January, 1937.

NAVAL GUNS AND MOUNTINGS.

	40 mm. 2-pdr.	40 mm. 2-pdr.	40 mm. 2·2-pdr.	47 mm. 3-pdr.	57 mm. 6-pdr.	4-in. 101·6 mm.	4-in. 101·6 mm.	4·7-in. 120 mm.	4·7-in. 120 mm.	5·118-in. 130 mm.	5·5-in. 139·7 mm.	5·906-in. 150 mm.
System	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore . . . . ins.	1·575	1·575	1·575	1·85	2·244	4	4	4·724	4·724	5·118	5·5	5·906
do. do. . . . . mm.	40	40	40	47	57	101·6	101·6	120	120	130	139·7	150
Length of Bore . . . . cals.	39·37	50	50	50	50	45	50	45	50	52	50	50
	lb.	lb.	lb.	c q. lb.	c. q.	c. q.	t. c. q. lb.	t. c.	t. c. q.	t. c.	t. c.	t. c.
Weight of Gun	590	655	1,433	5 3 14	9 1	36 0	2 3 1 14	2 19	3 6 3	4 8	4 13	6 15
do. do. . . . . kg.	268	297	650	298	470	1,830	2,204	3,000	3,391	4,470	4,740	6,858
Weight of Projectile . . . lb.	2	2	2·2	3·3	6	31	31	48·5	48·5	68	79·37	100
do. do. . . . kg.	0·91	0·91	1	1·5	2·72	14·06	14·06	22·0	22	30·85	36	45·4
Muzzle Velocity . . . . f.s.	2,000	2,461	2,625	2,800	2,600	2,700	3,000	2,789	3,000	3,000	3,000	2,940
do. do. . . . . m.s.	600	750	800	853	792	823	914	850	915	915	914	896
Muzzle Energy . . . . f.t.	54	84	105	180	280	1,565	1,935	2,616	3,025	4,245	4,953	5,995
do. do. . . . . m.t.	17·0	26	32	55·75	86·7	485	600	810	935	1,315	1,535	1,857
Penetration (W.I. at muzzle). ins.	..	..	..	6·7	7·5	13·6	16	16·6	18·0	20	22	23
do. . . . . mm.	..	..	..	170	190	345	405	420	460	510	560	585
Rounds per Minute	200	200	130—140	30	28	18	15	12	12	..	..	..
	lb.		lb.	c. q. lb.	c. q. lb.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q. lb.	t. c. q. lb.	t. c. q. lb.
Weight of Mounting and Shield	1,676	..	2,128	11 1 23	17 3 10	2 18 3	3 5 1	4 19 3	7 15 1	9 0 1 0	9 2 0 0	14 5 3 0
do. do. do. kg.	760	..	965	586	906	2,985	3,315	5,067	7,887	9,158	9,246	14,517
	..	..	..	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c q. lb.	t. c. q. lb.	t. c. q. lb.
Weight of Shield	..	..	..	1 0 20	1 2 10	7 2 0	14 1 13	7 3 0	18 3 21	19 0 0	1 2 0 0	3 4 0 0
do. do. . . . . kg.	..	..	..	60	80	380	730	394	962	965	1,188	3,250
Thickness of Shield . . . ins.	..	..	..	·22	·25	·144	·25	·144	·144	·144	·1875	·625 & ·375
do. do. . . . . mm.	..	..	..	5·6	6·35	3·65	6·35	3·65	3·65	3·65	4·76	16 & 9·5
Angle of Elevation . . . deg.	85	..	90	20	20	30	30	35	45	45	35	45
Angle of Depression . . . deg.	5	..	5	20	10	10	10	10	10	10	10	10

The above guns are of all-steel construction.

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VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. NAVAL GUNS AND MOUNTINGS—*continued.*

		6-in. 152 mm.	6-in. 152 mm.	8-in. 203 mm.	8-in. 203 mm.	8-in. 203 mm.	9·2-in. 234 mm.	10-in. 254 mm.	12-in. 305 mm.	13·5-in. 343 mm.	14-in. 356 mm.	15-in. 381 mm.	16-in. 406 mm.
Diameter of Bore	ins.	6	6	8	8	8	9·2	10	12	13·5	14	15	16
do. do.	mm.	152·4	152·4	203·2	203·2	203·2	233·7	254	304·8	342·9	355·6	381	406·2
Length of Bore	cals.	45	50	45	50	55	50	50	50	45	50	45	45
		t. c.	t. c. q.	t. c.	t. c.	t. c.	t. c. q.	t. c.	t. c.	t. c.	t. c.	t. c.	t. c.
Weight of Gun		6 10	6 17 2	14 0	15 14	16 10	28 16 2	26 1	43 10	66 0	80 0	87 0	105 0
do. do.	kg.	6,605	6,985	18,228	15,940	16,765	29,290	26,470	44,200	67,060	81,284	88,400	106,685
Weight of Projectile	lb.	100	100	250	256	256	380	500	850	1,400	1,560	1,951	2,000
do. do.	kg.	45·36	45·4	113·4	116·0	116·0	172·37	226·8	385·6	635	707·6	885	907·2
Muzzle Velocity	f.s.	2,850	3,000	2,845	3,000	3,150	3,000	2,933	2,933	2,500	2,475	2,500	2,650
do. do.	m.s.	869	915	867	914	960	914	894	894	762	754	760	808
Muzzle Energy	f.t.	5,630	6,240	14,030	15,976	17,615	23,714	29,825	50,705	60,675	66,260	84,550	97,390
do. do.	m.t.	1,745	1,930	4,345	4,950	5,445	7,340	9,235	15,705	18,790	20,520	26,185	30,160
Penetration (W.I. at muzzle)	ins.	22	24	31	34·5	38	38·8	41·7	50·3	51·5	51·65	55	59
do.	mm.	560	610	785	875	965	985	1,060	1,280	1,310	1,310	1,400	1,500
Rounds per Minute		10	..	5	6	6	4	3	2	1·5	1·5	..	1·2
		t. c. q.	t. c. q. lb.	t. c.	t. c.	t. c.	t.	t.	t.	t.	t.	t.	t.
Weight of Mounting and Shield		12 9 2	12 1 0 0	144 10	147 10	149 10	257	287	431	558	588	844	1,270
do. do. do.	kg.	12,675	12,245	146,800	150,000	152,000	261,100	291,600	438,000	567,000	597,500	857,500	1,290,000
		t. c. q. lb.	t. c. q. lb	t.	t.	t.	t.	t.	t.	t.	t.	t.	t.
Weight of Shield		4 4 3 16	3 4 0 0	24	24	24	102	115	150	192	191	315	670
do. do.	kg.	4,315	3,250	24,400	24,400	24,400	103,600	117,000	153,400	195,100	194,000	320,000	680,700
Thickness of Shield	ins.	1·5 & 1	·625 & ·375	1 & ·75	1 & ·75	1 & ·75	8, 7, 3 & 2	6, 4 & 1·5	13, 11 & 3	11, 4 & 3	10, 9 & 3	15, 12, 11 & 5	15, 11, 8, 4 & 3
do. do.	mm.	38 & 25·4	16 & 9·5	25 & 20	25 & 20	25 & 20	203, 178, 75 & 50	152, 102, & 38	330, 280, & 75	280, 102, & 75	254, 230, & 75	381, 305, 280, 127	381, 280, 203, 102 & 75
Angle of Elevation	deg.	30	35	70	70	70	15	40	15	20	25	30	40
Angle of Depression	deg.	5	10	3	3	3	5	5	5	5	5	5	5

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured for some of the above having approximately the same characteristics.

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	2·953-in. 75 mm. Field.	2·953-in. 75 mm. Field.	4·134-in. 105 mm. Field Howr.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	4·134-in. 105 mm. Field.	5-in. 127 mm. Field.	5·9-in. 150 mm. Howr.	6-in. 152 mm. Field.	8-in. 203 mm. Railway.	8·268-in. 210 mm. Semi-Mobile.	12-in. 305 mm. Railway.	15-in. 381 mm. Railway.
Diameter of Bore . . . ins.	2·953	2·953	4·134	4·134	4·134	4·134	4·134	5	5·9	6	8	8·268	12	15
do. do. . . . . mm.	75	75	105	105	105	105	105	127	150	152	203	210	305	381
Length of Bore . . . . cals.	30	40	21	26	35	45	50	41	21	45	50	40	50	45
	c. q.	c. q.	c. q.	c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c.	t. c.	t. c.	t. c.
Weight of Gun	7 3	11 3	11 2	12 0	1 5 0	1 13 0	1 14 0	2 11 2	1 11 0	5 12 1	15 5	10 19	43 10	87 0
do. do. . . . . kg.	394	597	584	610	1,270	1,675	1,725	2,615	1,575	5,700	15,500	11,125	44,200	88,400
Weight of Projectile . . lb.	14·33	14·33	26·45	33·07	35·27	35·27	35·27	56	90·4	100	256	286·6	850	1,951
do. do. . . . kg.	6·5	6·5	12·0	15·0	16	16·0	16	25·5	41·0	45·4	116	130	385·6	885
Muzzle Velocity . . . . f.s.	1,952	2,461	1,608	2,000	2,543	2,690	2,953	2,700	1,903	2,870	2,900	2,608	2,933	2,500
do. do. . . . . m.s.	595	750	490	610	775	820	800	823	580	875	884	795	894	760
Muzzle Energy . . . . f.t.	379	602	474	915	1,580	1,770	2,133	2,830	2,270	5,730	14,930	13,515	50,705	84,550
do. do. . . . . m.t.	117	186	147	284	490	548	659	877	703	1,774	4,625	4,185	15,705	26,185
Rounds per Minute	25	..	10	10	10	..	10	..	4	4	4	3	5 in 2 mins.	2
	t. c. q. lb.	t. c.	c. q. lb.	t. c. q. lb.	t. c. q.	t. c.	t. c. q.		t. c. q. lb.	t. c. q. lb.	t. c.	tons	tons	tons
Weight of Mounting and Shield .	1 1 1 25	1 4	19 1 16	1 9 2 0	2 7 0	2 19	2 16 0	..	3 13 1 8	7 13 3 20	62 8	28	175	275
do. do. do. kg.	1,091	1,219	985	1,498	2,388	2,997	2,842	..	3,725	7,820	63,400	28,450	177,800	279,400
	c. q. lb.		c. q. lb.	c. q. lb.										
Weight of Shield	1 2 10	..	1 2 24	0 3 0	No Shield	No Shield	No Shield	..	No Shield	No Shield	No Shield	No Shield	No Shield	No Shield
do. do. . . . . kg.	80·7	..	87	38	..	..	..	..	..	..	..	..	..	..
Thickness of Shield . . . ins.	·16	..	·125	·16	..	..	..	..	..	..	..	..	..	..
do. do. . . . mm.	4	..	3·2	4·06	..	..	..	..	..	..	..	..	..	..
Angle of Elevation . . . deg.	40	45	40	45	45	45	45	..	45	45	50	50	35½	40
Angle of Depression . . deg.	5	8	5	5	5	0	5	..	0	5	0	2	0	0

	TANK GUNS.			FOR VICKERS CARDEN LOYD VEHICLE.		MOUNTAIN HOWITZERS.		LANDING GUN.
	57 mm. 6-pdr. Semi-Auto.	47 mm. 3-pdr. Semi-Auto.	40 mm. 2-pdr. Semi-Auto.	47 mm. 3-pdr.		2·953-in. (75 mm.) Jointed.	4·134-in. (105 mm.) Jointed.	3-in. (76·2 mm.)
Diameter of Bore . . . . ins.	2·244	1·85	1·575	1·85		2·953	4·134	3
do. do. . . . . mm.	57	47	40	47		75	105	76·2
Length of Bore . . . . cals.	27	35	50	21		18	11	22
	c. q. lb.	c. q. lb.	c. q. lb.	lb.		c. q. lb.	c. q. lb.	c. q. lb.
Weight of Gun	2 2 14	2 2 0	2 0 13	165		3 2 4	5 0 0	3 3 4
do. do. . . . . kg.	133	127	108	74·8		179·8	254	192
Weight of Projectile . . . lb.	6	3·3	2	3·3		14·33	26·45	12·5
do. do. . . . . kg.	2·72	1·5	·91	1·5		6·5	12	5·67
				A.P. Shell.	H.E. Shell.			
Muzzle Velocity . . . . f.s.	1,200	1,854	2,600	1,600	984	1,450	1,148	1,640
do. do. . . . . m.s.	366	565	792	488	300	442	350	500
Muzzle Energy . . . . f.t.	60	79	93·7	58·6	22·2	210	242	233
do. do. . . . . m.t.	18·6	24·5	29	18·1	6·9	65·0	74·5	72·0
Rounds per Minute	..	..	..			18	10	25
	c. q. lb.	c. q. lb.	c. q. lb.			c. q. lb.	c. q. lb.	c. q. lb.
Weight of Mounting and Shield .	2 3 21	2 2 0	2 1 14			9 1 14	12 1 0	10 0 0
do. do. do. kg.	149	127	120·65			476	632	508
			lb.			c. q. lb.	c. q. lb.	c. q. lb.
Weight of Shield	..	..	15·25			1 1 0	1 3 6	1 1 15
do. do. . . . . kg.	..	..	6·92			50·8	92	70
Thickness of Shield . . . ins.	..	..	·4			·144	·16	·192
do. do. . . . mm.	..	..	10			3·6	4·0	4·875
Angle of Elevation . . . deg.	30	30	20			45	45	23
Angle of Depression . . . deg.	10	10	10			10	5	10

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VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. INFANTRY GUNS.

	44–60 mm.			47 mm.			65 mm.			70 mm. with 25·4 mm. S.C. Tube, on Platform Carriage.	
	44 mm. Barrel.		60 mm. Barrel.	Armour-Piercing Ammunition.		High-Explosive Ammunition.	High Explosive Ammunition.			70 mm. Barrel.	25·4 mm. S.C. Tube.
Diameter of Bore . . . ins.	1·73		2·36		1·85			2·559		2 756	1·0
do. do. . . . mm.	44		60		47			65		70	25·4
Length of Bore . . . . cals.	30		20		21			16		15	50
	Barrel.	Breech Ring.	Breech Mechanism.	Barrel.	Breech Ring.	Breech Mechanism.	Barrel.	Breech Ring.	Breech Mechanism.	Gun and Mechanism.	S.C. Tube.
Weight of Gun	75 lb.	50 lb.	26 lb.	75 lb.	68 lb.	28 lb.	88 lb.	62 lb.	38 lb.	172 lb.	56·5 lb.
do. do. . . . . kg.	34	22·7	11·8	34	30·8	12·7	38	28	17	78	25·6
Weight of Projectile . . lb.	2·75		5·5	3·3		3·3		8·8		8·8	0·55
do. do. . . . kg.	1·25		2·5	1·5		1·5		4		4	0·25
Muzzle Velocity . . . . . f.s.	1,706		732	1,600		755		820		700	2461
do. do. . . . . m.s.	520		223	488		230		250		213	750
Muzzle Energy . . . . . f.t.	55·5		20·4	58·6		13·0		41·0		30	23·1
do. do. . . . . m.t.	17·2		6·3	18		4		12·7		9·3	7·15
Weight of Mounting and Shield lb.		343			397			582		558 with Platform	
do. do. do. kg.		156			180			264		253 ,, ,,	
Weight of Shield . . . . lb.		—			45			106			
do. do. . . . kg.		..			20·4			48			
Thickness of Shield . . . ins.		..			0·14			0·16			
do. do. . . . mm.		..			3·5			4			
	44 mm. Barrel.		60 mm. Barrel.	Low Position.		High Position.	Low Position.		High Position.		
Angle of Elevation . . . deg.	10		20 to 60	15		45	17		45	45	15 Nominal
Angle of Depression . . . deg.	5		0	10		2½	10		2	10	10

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Vickers-Armstrongs Limited—Guns and Mountings. Guns Mounted on Aircraft.

	* ·303-in. (7·7 mm.) for aircraft gun.	*·303-in. (7·7 mm.) Observer's gun.	*·303-in. (7·7 mm.) Pilot's gun.	·5-in. (12·7 mm.) Observer's gun.	·5-in. (12·7 mm.) Pilot's gun.	·5-in. (12·7 mm.) Observer's Gun.	1·457-in. (37 mm.) Observer's gun.	1·575-in. (40 mm.) Observer's gun.
System	Vickers-Armstrongs Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Armstrongs Recoil operated.	Vickers Semi-Auto. operated.
Diameter of Bore . . ins.	·303	·303	·303	·5	·5	·5	1·457	1·575
do. do. . . mm.	7·7	7·7	7·7	12·7	12·7	12·7	37	40
Length of Bore . . cals.	72	79·2	93·7	50	62·2	72	39·5	40
Weight of Gun . . lb.	20·5	25	26·5	45	52·5	70	200	234
do. do. . . kg.	9·3	11·3	12	20·4	23·8	32	90·72	106
Weight of projectile . lb.	174 grs.	174 grs.	174 grs.	565 grs.	565 grs.	690 grs.	1·47	2
do. do. . kg.	11·3 grms.	11·3 grms.	11·3 grms.	36·6 grms.	36·6 grms.	44·7 grms.	0·666	0·91
Muzzle Velocity . . . f.s.	2,400	2,400	2,440	2,450	2,550	2,800	1950	2,300
do. do. . . m.s.	732	732	744	746	777	853	594	700
Muzzle Energy . . . f.t.	0·9	0·9	1	3·36	3·64	5·36	38·72	73
do. do. . . m.t.	0·28	0·28	0·31	1·04	1·125	1·66	11·98	22·6
Rounds per Minute . . .	900–1000	650–750	900–1000	450–650	450–650	400–450	100	..
Weight of Mounting . . lb.	5	..	..	..	..	..	102	432
do. do. . . kg.	2·3	..	..	..	..	..	46	196
Angle of Elevation . deg.	90	..	..	..	..	..	55	60
Angle of Depression . deg.	90	..	..	..	..	..	40	30

Machine Guns—Anti-Aircraft.

	*·303-in. (7·7 mm.)	*·303-in. (7·7 mm.)	·5-in. (12·7 mm.)	·5-in. (12·7 mm.)	·5-in. (12·7 mm.)
System	Vickers Recoil operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.
Diameter of Bore . . . ins.	·303	·303	·5	·5	·5
do. do. . . . mm.	7·7	7·7	12·7	12·7	12·7
Length of Bore . . . . cals.	93·7	72	62·2	90	72
Weight of Gun . . . . lb.	32	22	52·5	101	70
do. do. . . . . kg.	14·5	10	23·8	40·6	32
Weight of Projectile . . lb.	174 grs.	174 grs.	565 grs.	690 grs.	690 grs.
do. do. . . . kg.	11·3 grms.	11·3 grms.	36·6 grms.	44·7 grms.	44·7 grms.
Muzzle Velocity . . . f.s.	2,440	2,400	2,550	3,000	2,800
do. do. . . . m.s.	744	732	777	914	853
Muzzle Energy . . . . . f.t.	1	0·9	3·64	6·15	5·36
do. do. . . . . m.t.	·31	0·28	1·125	1·9	1·66
Rounds per minute	500–600	450–500	450–650	350–450	400–450

* This gun can be adapted to fire any pattern of rifle calibre ammunition.

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VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. ANTI-AIRCRAFT GUNS.

	40 mm. 2-pdr.	40 mm. 2-pdr.	40 mm. 2·2-pdr.	40 mm. 2·2-pdr.	47 mm. 3-pdr.	Mobile 75 mm. 40 Calibre	Mobile 75 mm. 46 Calibre	3-inch	4-in.	4-in.	105 mm. 45 Calibre	4·7-in.
System	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Construction	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Diameter of bore . ins.	1·575	1·575	1·575	1·575	1·85	2·953	2·953	3	4	4	4·134	4·724
,, . mm.	40	40	40	40	47	75	75	76·2	101·6	101·6	105	120
Length of bore ,, . cals.	39·37	50	50	50	50	40	46	50	45	50	45	40
	lb.	lb.	lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	t. c. q.	t. c. q.	t. c. q. lb.	t. c. q.	t. c. q.
Weight of gun .	590	655	1,433	2 0 17	5 3 14	11 0 0	13 0 12	1 3 1	1 16 1	2 3 1 14	2 1 2	3 1 0
,, ,, . kg.	268	297	650	109	298	560	666	1181	1842	2204	2,110	3,100
Weight of projectile lb.	2	2	2·205	2·205	3·3	14·33	14·33	14·33	31	31	35·274	48·5
,, ,, . kg.	·91	·91	1	1	1·5	6·5	6·5	6·5	14·06	14·06	16	22
Muzzle velocity ,, . f.s.	2,000	2,461	2,625	2,625	2,800	2,461	2,641	2,560	2,700	3,000	2,625	2,560
,, ,, . m.s.	600	750	800	800	853	750	805	780	823	915	800	780
Muzzle energy . f.t.	54	84	105	105	180	602	695	650	1,565	1,935	1,685	2,205
,, ,, . m.t.	17	26	32	32	55·75	186	215	201	485	599	522	683
Rounds per minute .	200	200	130–140	35	30	..	..	25	18	18	..	12
	c. q. lb.		c. q. lb.	c. q.	c. q. lb.	t. c. q. lb.	t. c. q. lb.	t. c. q.	t. c. q. lb.	t. c. q. lb.	t. c. q.	t. c. q. lb.
Weight of mounting (exclusive of Gun) .	14 3 24	..	19 0 0	12 3	18 2 3	2 5 2 23	2 5 2 18	2 18 2	6 14 0 18	7 13 2 14	5 18 2	9 0 1 0
,, ,, . kg.	760	..	965	647·6	941·1	2,322	2,320	2425·8	6815	7,805	6,020	9157·1
Angle of elevation . deg.	85	..	90	90	80	90	90	90	90	90	90	90
Angle of depression deg.	5	..	5	0	5	0	0	5	5	5	5	5

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	*·303-in. (7·7-mm.) Observer's Gun for Aircraft.	*·303-in. (7·7-mm.) Pilot's Gun for Aircraft.	*·303-in. (7·7-mm.) Land and Naval.	*·303-in. (7·7-mm.) Gun for Aircraft.	*·303-in. (7·7-mm.) for Infantry.	·5-in. (12·7-mm.) Observer's Gun for Aircraft.	·5-in. (12·7-mm.) Pilot's Gun for Aircraft.	·5-in. (12·7-mm.) Land and Naval.	·5-in. (12·7-mm.) Land and Naval.	·5-in. (12·7-mm.) Observer's Gun for Aircraft.	·5-in. (12·7-mm.) for Anti-Aircraft and Anti-Tank.	1·457-in. (37-mm.) Observer's Gun for Aircraft.	1·575-in. (40-mm.) 2-pr. Anti-Aircraft.	1·575-in. (40-mm.) 2-pr. Auto.	1·575-in. (40-mm.) 2·2-pr. Anti-Aircraft.
System.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Arm-strongs Gas operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Arm-strongs Gas operated.	Vickers-Arm-strongs Gas operated.	Vickers-Arm-strongs Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.
Diameter of Bore . ins.	·303	·303	·303	·303	·303	·5	·5	·5	·5	·5	·5	1·457	1·575	1·575	1·575
do. do. . mm.	7·7	7·7	7·7	7·7	7·7	12·7	12·7	12·7	12·7	12·7	12·7	37	40	40	40
Length of Bore . . cals.	79·2	93·7	93·7	72	72	50	62·2	62·2	90	72	72	39·5	39·37	50	50
Weight of Gun . . lb.	25	26·5	32	20·5	22	45	52·5	52·5	101	70	70	200	590	655	1,433
do. do. . . kg.	11·3	12	14·5	9·3	10	20·4	23·8	23·8	40·6	32	32	90·72	268	297	650
Weight of Projectile . grs.	174	174	174	174	174	565	565	565	690	690	690	1·47 lb.	2 lb.	2 lb.	2·2 lb.
do. do. . grms.	11·3	11·3	11·3	11·3	11·3	36·6	36·6	36·6	44·7	44·7	44·7	0·666 kg.	·91 kg.	·91 kg.	1 kg.
Muzzle Velocity . . f.s.	2,400	2,440	2,440	2,400	2,400	2,450	2,550	2,550	3,000	2,800	2,800	1950	2,000	2,461	2625
do. do. . . m.s.	732	744	744	732	732	746	777	777	914	853	853	594	600	750	800
Muzzle energy . . f.t.	0·9	1	1	0·9	0·9	3·36	3·64	3·64	6·15	5·36	5·36	38·72	54	84	105
do. do. . . m.t.	0·28	0·31	0·31	0·28	0·28	1·04	1·125	1·125	1·9	1·66	1·66	11·98	17	26	32
Rounds per minute . . .	650–750	900–1000	500–600	900–1000	450–500	450–650	450–650	450–650	350–450	400–450	400–450	100	200	200	130–140
Weight of Mounting . . lb.	..	..	..	5	..	..	..	..	..	..	..	102	1,676	..	2,128
do. do. . . kg.	..	..	..	2·3	..	..	..	..	..	..	..	46	760	..	965
Angle of Elevation . . .	..	..	..	90°	..	..	..	..	..	..	..	55°	85°	..	90°
Angle of Depression . . .	..	..	..	90°	..	..	..	..	..	..	..	40°	5°	..	5°

* This gun can be adapted to fire any pattern of rifle calibre cartridge.

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BEARDMORE GUNS AND HOWITZERS.

		Naval.																	
Calibre	ins.	4	4	4·7	4·7	4·7	5·5	5·5	5·5	6·0	6·0	7·5	8	8	9·2	12	13·5	15	16
do.	mm.	101·6	101·6	120	120	120	140	140	140	152	152	190	203·2	203·2	234	305	343	381	406
Length of Bore	cals.	50	55	50	45	52·5	55	55	40	50	52·5	45	50	55	50	50	46	45	45
Weight of Gun	tons	2·15	2·45	3·65	3·35	3·85	8·0	6·8	5·35	7·95	8·1	13·9	17·5	19·25	29	66	77	96	107
do. do.	kg.	2,184	2,489	3,711	3,405	3,911	8,128	6,910	5,435	8,077	8,230	14,122	17,780	18,542	24,402	67,056	78,232	97,536	108,712
Weight of Projectile	lbs.	31	31	50	50	48·5	92·6	82	75	100	100	200	250	250	425	950	1,350	1,850	2,100
do. do.	kg.	14·06	14·06	22·68	22·68	22	42	37·2	34	45·36	45·36	90·72	114·2	114·2	192·8	430·9	612·4	839·2	952·5
Muzzle Velocity	f.s.	2,920	3,000	2,950	2,650	3,000	2,950	3,000	2,650	2,970	3,000	2,750	2,900	3,000	2,825	2,825	2,650	2,620	2,675
do. do.	m.s.	890	914	900	808	914·4	900	914·4	808	905·2	914·4	838	884	914	861	861	808	799	815
Muzzle Energy	f.t.	1,833	1,935	3,017	2,434	3,026	5,587	5,117	3,652	6,116	6,240	10,488	14,579	15,602	23,518	52,571	63,738	88,056	104,198
do. do.	m.t.	568	599	934	837	937	1,730	1,584	1,131	1,894	1,938	3,248	4,515	4,832	7,283	16,280	20,441	27,270	32,270

		Motor Boats or Submarines.	Submarine.	Anti-Aircraft.							Tank Guns.	
				For Submarines.	Fixed.	Fixed.	Fixed.	Fixed.	Mobile.			
Calibre	ins.	3·0	4·0	3·0	3·0	4·0	4·0	4·724	3·02	3·3	1·85	2·24
do.	mm.	75	101·6	75	75	101·6	101·6	120	77	84	47	57
Length of Bore	cals.	45	40	45	45	45	50	40	47·5	42·5	30·0	23
Weight of Gun	ton	0·67	1·3	0·64	1·65	1·95	2·1	3·1	0·75	1·1	1·8 cwt.	5·6 cwt.
do. do.	kg.	686	1,321	648	1,675	1,981	2,133	3,150	762	1,120	90·7	284
Weight of Projectile	lbs.	12·5	31	16	16	31	31	48·5	17·6	21	3·25	6
do. do.	kg.	5·67	14·06	7·26	7·26	14·06	14·06	22	8·0	9·53	1·49	2·72
Muzzle Velocity	f.s.	2,200	2,250	2,100	2,590	2,600	2,850	2,560	2,175	2,300	1,750	1,525
do. do.	m.s.	670	685·8	640	790	792	869	780	663	701	533	465
Muzzle Energy	f.t.	419	1,088	489	744	1,453	1,740	2,205	577	770	69	96·7
do. do.	m.t.	130	337	151	230	450	530	672	179	238	21·6	30
				Semi-Auto.								

		Anti-Tank.			Field Guns and Howitzers.									
		Infantry Guns.			Gun.	How.	How.	How.	How.	Gun.	How.	How.	Mountain H.	
Calibre I	ins.	1·85	1·575	2·24	3·3	4·134	3·3	4·5	6	6	8	9·2	3·3	
do.	mm.	47	40	57	84	105	84	112	152·4	152·4	203·2	234	84	
Length of Bore	cals.	28·5	37	24	31	20	15	20	13	35	17	17	12·25	
Weight of Gun		cwts. 1·03	cwts. 0·92	cwts. 0·92	cwts. 7·25	cwts. 8·0	cwts. 4·28	cwts. 9	tons 1·15	tons 3·7	tons 3·0	tons 4·25	wts. 4·0	
do. do.	kg.	52·4	46·7	46·7	369	406	194	458	1,168	3,759	3,048	4,318	203	
Weight of Projectile	lbs.	3·25	2·0	6·0	18·5	35·2	18·5	35		100	200	290	18·5	21·0
do. do.	kg.	1·49	0·91	2·72	8·39	16	8·39	15·88	45·36	45·36	90·72	131·5	8·39	9·53
Muzzle Velocity	f.s.	1,550	2,000	700	1,820	1,350	1,100	1,100	1,250	2,375	1,500	1,500	1,040	960
do. do.	m.s.	473	609·6	213·4	555	412	335	335·3	381	724	457	457	317	290
Muzzle Energy	f.t.	54	55	20·4	425	444	155	293·6	1,083	3,911	3,120	4,524	138	134
do. do.	m.t.	16·7	17	6·3	131	138	48	90·9	335	1,211	956	1,401	42·7	41·5
		S.A.	S.A.	S.A.										
		In same carriage.								In same carriage.				

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BRAZIL NAVAL ORDNANCE.

Calibre in Centimetres. Length in Calibres.	Model and Maker.	Year of Construction.	Weight of gun in kilograms.	Projectile.			Carried by.
				Weight of Projectile in kilograms.	Velocity in metres per second.	Muzzle energy in Tons.	
305 m/m. 45 . .	Model I, Armstrong	1908	61·947	385,500	853	—	Es M. Geraes and S. Paulo.
120 m/m. 40 . .	Model II, ,,	1898	2·794	20,040	793	—	M Pernambuco and T.D.T. Belmonte.
120 m/m. 50 . .	Model III ,,	1908	3·369	20,400	915	—	Minas, S. Paulo, Bahia and Rio Grande do Sul.
120 m/m. 41 . .	Model Ansaldo	—	—	—	—	—	Humayta.
101,6 m/m. 40 . .	Model II, Armstrong	1908	1,321	14,000	701	—	C.T.s. Piauhy, R.G. Norte, Parahyba, Alagôas, Sergipe, S. Catharina and Matto-Grosso.
101,6 m/m. 40 .	Model III, Armstrong	1922	1,339	14,000	701	352	C.T. Maranhão and T.D.S. Ceará.
101,6 m/m. . . .	Model, N. Vickers-Armstrong	1934	—	14,061	853	—	N.E. Almirante Saldanha.
87 m/m. 8 . .	Armstrong	1898	109	6,800	289	—	Oyapock.
76 m/m. 50 . .	Model I, Bethlem	1918	—	5,900	823	—	Minas and São Paulo.
76,2 m/m. A.A. .	Vickers-Armstrong, Model I	1934	—	5,56	620	—	Almirante Saldanha.
76,2 m/m. T.R.S.A.	,, ,, ,,	1934	—	5,56	780	—	Almirante Saldanha.
57 m/m. 40 . .	Model I, Hotchkiss	1898	365	2,700	553	42·4	Ceará.
47 m/m. 40 . .	,, ,,	1898	220	1,500	610	28·5	Pernambuco, J. Bonifacio, Salles de Carvalho and Oyapock.
47 m/m. 50 S.A. .	Model I, Armstrong	1908	259	1,500	701	—	Piauhy, R. G. Norte, Parahyba, Alagôas, Sergipe, S. Catharina and Matto-Grosso. Minas and São Paulo.
47 m/m. 50 . .	Model II, Armstrong	1908	371	1,500	817	—	Bahia, R. G. Sul and Maranhão.
47 m/m. 46 S.A. .	Model III ,,	1908	371	1,500	817	—	Ceará.
47 m/m. 45 . .	Model I, Nordenfeldt	1898	233·4	1,497	585	—	Oyapock.
38 m/m. 41 . .	,, ,,	1898	—	0·810	—	—	M. Couto, M. Alves, and Lahmeyer.
37 m/m. 42 . .	Model I, Hotchkiss	1898	120	0·850	600	15·5	Pernambuco and Oyapock.
37 m/m. 30 . .	,, M. Nordenfeldt	1898	189	0·453	549	—	Oyapock, Pernambuco and Voluntario.

This Table has been supplied through the courtesy of Captain Natal Arnaud, Brazilian Acting Naval Attaché in London.

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FRENCH NAVAL ORDNANCE.

August, 1936.

Calibres (mm.)	340	330	305	203	155	152	138			130		100	90	75	37
Model	1912	—	1906–10	1924	1920	1930	1929	1923	1910	1924	1919	1917	1926	1924	1925
Length (in calibres)	45	—	45	50	50	55	—	40	55	40	40	45	50	50	50
Weight of gun (Kgs.)	66,280	—	54,020	20,716	8,530	8,000	—	4,113	5,300	3,875	4,392	1,565	1,600	1,095	158
Weight of projectile	554	—	432	123	560	54	—	40	39	32	32	14	9·5	6	0·75
Weight of charge (Kgs.)	151	—	126	47	19·6	17	—	9	11	8	8	4	3	2	0·25
Pressure (kg/cm²)	2,800	—	2,400	2,750	3,050	3,200	—	2,500	2,500	2,420	2,420	2,300	3,200	2,560	2,400
Muzzle velocity (m/sec.)	794	—	783	850	850	870	—	700	830	734	734	720	850	850	850

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GERMAN NAVAL ORDNANCE.

Calibre.	Usual Naval Designation.	Length in Cals.	Date of Model.	Weight of Gun.	Weight of A.P. Shot.	Initial Velocity.	Maximum penetration direct impact against K.C. at			Danger space against average ships at			Approximate Muzzle Energy.
							9,000 yards.	6,000 yards.	3,000 yards.	10,000	5,000	3,000	
inch	c/m			tons	lbs.	foot-secs.	inches	inches	inches	yards	yards	yards	foot-tons
11	28	..	'28	..	670	..	..	..	..	..	..	..	..
11	28	40	'01	32·2	661·4	2756	6	10	14	150	450	740	31,600
6·7	17	40	'01	7·5	154·5	2756	..	3	5	80	240	460	8,275
5·9	15	50	..	5·5	101·4	3084	..	..	..	..	..	..	6,690
5·9	15	45	'09	5		2920	..	..	5	..	200	420	5,990
4·1	10·5	45	'16	..	38·2	..	..	..	..	..	..	..	..

Brass cartridge cases to all guns.

Lesser guns: 3·4 inch (88 m/m) firing 22 lb. projectiles in modern and 15 lb. in old models.
A.A. guns: 6 inch, 4·1 inch, 3·4 inch War Marks on H.A. mounts ("Flak").
Projectiles: Guns of 11 inch and over fire A.P., Ersatz A.P., H.E., and common shell.
The 1899 and later models have the recoil utilized to return the gun to firing position for pieces over 6 inch. In 6 in., springs are employed. German guns have a lower muzzle pressure than normally obtains.
11 inch, 40 cal., M. '01 in Deutschland and Braunschweig classes.

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ITALIAN NAVAL ORDNANCE.

Official Designation :— Calibre mm., length cal.	305/46	254/45	254/45	203/53	203/50	190/45	152/53	152/50	152/45	120/50	120/50	120/45	102/45	100/47	102/35	76/50	76/45	76/40	76/17
Mark A. = Armstrong, V = Vickers, An. = Ansaldo. S. = Schneider.	A., V.	A.	V.	An.	S.-An.	A., V.	An.	A.	S.	An. 1926	A., V.	A. 1918	S. A.		S.	A., V.	S.	A.	S.
Mark O.T.O. = Odero-Terni-Orlando							O.T.O.			O.T.O.		O.T.O.		O.T.O.					
Date of introduction.	1909	1907	1906	1929	1924	1906	1927–29	1918	1911	1931	1909	1928–1931	1917	1929	1914–1915	1909	1911	1916	1912
Designation by calibre, cm.	30·479	25·4	25·4	20·3	20·3	19·05	15·24	15·24	15·24	12·0	12·0	12·0	10·2	10·0	10·2	7·62	7·62	7·62	7·62
Calibre in inches	12	10	10	8	8	7·5	6	6	6	4·75	4·75	4·75	4	3·9	4	3	3	3	3
Lengths: Total, in feet	47·77	39·07	38·715	36·646	34·593	29·22	27·83	25·94	23·42	19·57	20·38	18·38	15·715	15·721	12·247	13·271	11·722	10·292	4·593
Lengths: Rifled Bore, in inches	477·9	358·4	370·5	358·66	—	281·7	—	256·6	219·2	—	204·64	174·64	150·74	12·365	114·29	126	107·2	101·57	44·8
Lengths: Powder Chamber in inches	97·7	74·91	74·91	64·56	—	51·65	—	44·6	44·6	—	28·64	35·03	27·16	3·112	23·50	22	25·4	—	—
Lengths: Bore in calibres	37·3	35·84	37·05	—	—	37·5	—	42·77	36·54	—	43·31	36·96	37·53	15·371	28·46	42	35·73	28·42	14·96
No. of Grooves	72	60	70	52	52	44	44	36	56	36	36	36	40	26	32	28	25–8	16	24
Twist of Rifling, in calibres	30	30	00–30	—	30	00–30	30	33	36	30	30	30	—	30	—	30	35·9	33	22
Total Weight in tons	62·99	34·49	35·339	19·170	20·800	14·478	7·700	8·100	7·025	3·00	3·662	4·035	2·327	2·020	1·200	1·122	0·698	0·660	0·104
Firing Charge: Armour-piercing projectile lb.	346	185	185	111·994	103·19	70·987	43	—	—	—	—	—	—	—	—	—	—	—	—
Firing Charge: Common Shell, H.E., lb.	279·9	185	185	—	—	70·987	—	32·79	30·64	—	14·66	9·589	9·479	10·319	6·50	3·02	3·571	2·281	0·529
Bursting Weight: Armour-piercing projectile lb.	997·2	494	494	275·573	260	200·39	103·5	—	—	50·5	—	—	—	—	—	—	—	—	—
Bursting Weight: Shell, H.E., lb.	884·4	489·8	489·8	—	—	498·5	—	110·22	103·61	—	48·74	48·74	30·31	30·318	30·31	14·05	14·05	13·954	11·68
Bursting Weight: Shrapnel, lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11·68
Bursting Charge: Armour-piercing projectile lb.	16·63	4·37	4·37	—	—	2·332	—	—	—	—	—	—	—	—	—	—	—	—	—
Bursting Charge: Shell, H.E. lb.	53·13	29·86	29·86	—	—	11·706	—	5·996	7·528	—	2·711	2·711	2·866	—	2·866	1·102	1·102	—	0·782
Bursting Charge: Shrapnel, lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·165
Muzzle Velocity in ft. secs.	2755·9	2788·77	2788·77	3051·180	2743·20	2788·77	2786	2854	2723	2786	2788	2460	2788	2438·40	2460	2460	2460	2214	1230
Muzzle Energy: Total tons per sq. inch	18·63	17·71	17·71	—	—	17·98	—	18·37	16·86	—	18·37	15 75	18·37	—	18·37	18·37	15·75	—	12·47

Calibre 381 for battleships "Littorio" and "Vittorio Veneto," and calibre 320 for battleships "Cavour" and "Cesare"; 305/46 A.V., "Duilio" and "Doria" class; 254/45 A., "S. Giorgio" class; 254/45 V., "Pisa"; 203/53 An., 1929, "Zara" class; 203/50 S.An. "Trento" class; 190/45 A.V., "S. Giorgio" and "Pisa" class; 152/53 An., O.T.O., "Colleoni" class; 152/45 S. "Duilio" class; 120/50 An., "Vivaldi" class; 120/50 A.V., "Quarto" and "Cesare"; 120/45 A., "Leone"; 100/47 O.T.O. "Trento," "Zara" and "Colleoni" class.

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JAPANESE NAVAL ORDNANCE

Date and Pattern of Gun.	KM. (1)	V. (2)	A. (3)	V. (4)	A. (5)	A. (6)	V. (7)	— (8)	A. (9)	Carried by
Desig. by Calibre, in cms.	40·6	35·6	20·3	15·2	15 2	15·2	15·2	14	12	(1) Mutu Class.
Calibre, in inches	16	14	8	6	6	6	6	5·5	4·7	(2) Ise Class. Husô Class. Kongô Class.
Total length, in feet	..	..	..	..	..	..	..	..	..	
Length of Bore, in ins.	..	..	..	..	..	..	..	..	..	(4) Kongô.
Length of Bore, in cals.	45	45	45	50	50	45	45	50	45	(5) Husô Class. Kongô Class (except Kongô). Yahagi.
Total weight, in tons.	..	83	17·3	8	8·7	8·5	7·5	6·25	3·3	
Weight of Firing Charge, Armour-piercing Projectile lb.	..	..	..	..	..	..	..	..	..	(8) Ise Class. Mutu Class. Kuma Class. Tenryû Class.
Weight: Armour-piercing Projectile lb.	2190	1400	250	100	100	100	100	82	45	
Weight: Common Shell "	..	..	..	..	..	..	..	..	..	(9) Yodo.
Muzzle Velocity, in f.-s., A.P. Projectile	2780	2526	2740	3000	3000	2130	3000	2725	2988	
Muzzle Energy in foot-tons	118,000	62,500	13,100	6300	6300	3165	6300	4250	2810	
Perforation at Muzzle,† wrought iron, inches	65	48·2	30·5	25·5	25·5	18·3	25·5	20·8	19·2	
Perforation Krupp Steel, 3000 yds.	13·8 at 10,970 metres	..	10½	6½	6½	4½	6½	..	2½	

† By Tressider's Formula.

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NETHERLANDS NAVAL ORDNANCE.

Pattern of Gun :—K.=Krupp; B.=A. B. Bofors; V.=Vickers; H.I.H.=Holl. Ind. Handel Mij.

	K.	K.	K.	B.	H.I.H.	B. 15 cm. double	B.	H.I.H.	K.	B.	H.I.H.	B.	H.I.H.	K.	K.	K.	V. 2 pdr.	B. 2 pdr. double
Diameter of Bore mm.	280	240	150	150	150	150	120	120	105	88	88	75	75	75	50	50	40	40
Length of Barrel cal.	40	40	50	50	50	50	50	50	50	45	45	55	55	55	40	55	40	60
Weight of Gun kg.	31,000	24,500	7,240	7,250	7,420	7,500	4,060	4,265	2,475	1,475	1,665	1,385	1,665	1,470	245	365	280	320
Weight of Projectile kg.	270	172·85	46	46	46·25	46·25	24	24	18	10	10	5·90	5·90	5·90	1·75	1·76	0·906	0·955
Muzzle Velocity m/sec.	890	814	900	900	900	900	900	900	883	800	800	895	895	895	680	895	600	900
Range max. . . m.	16,100	17,200	22,000	22,000	22,000	22,000	16,000	16,000	12,000	11,400	11,400	10,500	10,500	10,500	6,000	6,000	5,000	8,500
Rounds per Minute .	3	4	10	10	10	20	15	15	15	20	20	28	28	28	25	30	230	240
Weight of Gun, Mounting and Shield kg.	197,424	125,700	19,525	20,500	20,790	72,000	8,610	9,770	8,245	4,603	3,411	4,700	4,700	4,695	1,128	948	910	3,500
Weight of Shield kg.	—	—	5,270	6,100	6,400	24,200	310	310	2,770	—	—	—	—	—	—	—	—	—
Angle of Elevation degr.	15	20	25	29	30	60	30	35	20	70	35	95	90	80	20	15	85	90
Angle of Depression degr.	4	4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

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NORWEGIAN NAVAL ORDNANCE.

THE COAST ARTILLERY.

Official designation:— Calibre mm., length cal.	305	280	280	240	210	210	150	150	150	120
Mark A. = Armstrong, B. = Bofors, Kr. = Krupp, Wh. = Whitworth, St. Ch. = St. Chamond	H*/30 B.	K†/40 Kr.	H*/14 Wh.	H*/13, 16 St. Ch.	K†/45 A.	K†/45 St. Ch.	K†/50 A.	K†/50 B.	K†/47, 5 A.	K†/43, 9 A.
Design. by calibre in cm.	30·5	28	28	24	20·93	20·93	14·91	14·92	14·91	12
Calibre in inches	12	11·02	11·02	9·45	8·24	8·24	5·87	5·87	5·87	4·72
Length: Total in mm.	9,150	11,200	4,090	3,158	9,520	9,520	7,720	7,703	7,082	5,400
Length: ,, inches	360·23	440·95	161·02	124·33	374·80	374·80	303·93	303·26	278·81	212·6
Length: Rifled bore in mm.	7358·2	8,235	3,192	2719·7	7866·4	7863·1	6547·7	6359·1	5971·5	4552
Length: ,, ,, inches	289·69	324·21	125·66	107·08	309·7	309·57	257·78	250·36	235·26	179·21
Length: Bore in calibre	30	37	13	12·7	43·8	43·8	50	50	46	43·9
Capacity of Powder Chamber in dm.³	85	164·6	26·2	17·8	56·20	56·20	25·4	28·5	18·12	8·47
,, ,, ,, cubic inches	5,187	10044·7	1598·9	1086·3	3429·6	3429·6	1,550	1739·2	1105·8	517
No. of grooves	80	84	72	72	32	64	36	44	28	26
Twist of rifling in calibres	40–25	45–25	40–15	14–78	0–30	29–89	0–30	45–30	0–30	0–30
Total weight in tons	132	80·8	39·5	20	64	43·9	—	38·4	19·6	5·6
Weight of firing charge, kg.	59	62	7·86–7·95	4·75	24·85	24·85	—	15	9·71	4·5
,, ,, ,, lb.	129·8	136·4	17·3–17·5	10·45	54·67	54·67	—	33	21·36	9·9
Weight of projectile, kg.	385·6	345–255	345–215	215	140	140	45	45	45	20·4
,, ,, ,, lb.	848·3	759–561	759–473	473	308	308	99	99	99	44·9
Muzzle velocity, m./sec.	615	630–706	290–350	285	700	700	900	900	778	783
,, ,, feet/sec.	2017·8	2067–2316·4	952·4–1148·4	935·1	2296·7	2296·7	2961·9	2961·9	2552·6	2569
Muzzle energy in m. tons	7433·5	6979·2–6477·2	1478·8–1342·4	890·1	3500	3500	1857·8	1857·8	1388	638
Muzzle energy ,, foot tons	24389·3	22898·8–21251·7	4851·9–4403	2920·4	11483·5	11483·5	6095·4	6095·4	4554	2093·3

* Howitzer.

† K means gun.

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NORWEGIAN NAVAL ORDNANCE.

THE NAVY.

Official designation:— Calibre mm., length cal.	210/44	150/46	120/44	120/44	100/40	76/50	76/40	76/28	76/28 A.A.	76/21 A.A.	65/43
Mark A. = Armstrong, B. = Bofors, N. = Nordenfelt	A.	A.	A. N.	B.	B.	B.	A.	B.	B.	B.	H. N.
Design. by calibre in cm.	20·93	14·91	12	12	10·16	7·6	7·6	7·6	7·6	7·6	6·5
Calibre in inches	8·24	5·87	4·7	4·7	4	3	3	3	3	3	2·6
Length: Total in mm.	9,520	7,093	5,400	5,610	4,334	4,066	3139·4	2,316	2,316	1,782	3,025
Length: ,, in inches	374·8	279·25	212·6	220·9	170·6	160	123·6	91·2	91·2	70·2	119·1
Length: Rifled bore in mm.	7,866	5,949	4,552	4,524	3,397	3243·6	2,600	1834·1	1834·1	1300·1	2333·5
Length: ,, ,, in inches	309·7	234·2	179·2	178·1	133·7	127·7	102·4	72·2	72·2	51·2	91·9
Length: Powder chamber in mm.	1,234	828	661·6	769	587·2	518·45	410·7	251·7	251·7	251·7	421
Length: ,, ,, ,, inches	48·6	32·6	26	30·3	23·1	20·4	16·2	9·91	9·91	9·91	16·57
Length: Bore in calibres	43·8	45·8	44	44·1	40	50	40	28	28	21	43·4
No. of grooves	32	28	26	36	32	28	16	28	28	28	26
Twist of rifling in calibres	0–30	0–30	0–30	25·6	30	30	0–30	27	27	30	0–28
Total weight in tons	96·5	17·9–12·9	8·56	8	5	2	3·15–1·43	0·974	1·3	0·888	1·63
Weight of firing charge, kg.	26	10·7	4·5	4·88	3·25	1·75	1·05	0·46	0·46	0·46	0·9
,, ,, ,, lb.	57·3	22·2	9·92	10·76	7·16	3·85	2·31	1·01	1·01	1·01	1·98
Weight of projectile, kg.	142	45	20·41	21	14·06	5·67	5·67	5·67	5·67	5·67	4·0
,, ,, ,, lb.	313	99·3	44·9	46·3	31	12·5	12·5	12·5	12·5	12·5	8·8
Muzzle velocity, m. sec.	700	800–808	783	800	775	860	674	500	500	460	725
,, ,, feet sec.	2,297	2,625–2,651	2,569	2,625	2,543	2,887	2,211	1,640	1,640	1,510	2,379
Muzzle energy: in m. tons	3,500	1,468–1,500	638	685	429	214	131	72·2	72·2	61·2	107
Muzzle energy: in foot tons	11,484	4,817–4,992	2,093	2,248	1,408	702	430	237	237	200	351

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SPANISH NAVAL ORDNANCE.

Calibre.	Length.	Weight of Gun.	Total Weight.	Weight of Charge.	Weight of Shell.	Initial Velocity.	Muzzle Energy.
	m.	kgs.	kgs.	kgs.	kgs.	m.p.s.	Tn. m.
305 mm.	15·659	65,646	91,131	130	385·55	894	15,984
203·2 ,, ...	10·476	15,900	40,250	35·8	116·1	885	4,698
152·4 ,, ...	7·867	8,738	21,337	15	45·36	900	1,920
120 ,, ...	5·582	3,226	9,639	6·4	22	850	813
120 ,, (G.A.) . .	5·691	2,985	10,655	6·1	22	853	818·5
101·6 ,, 50 C. . . .	5·292	2,120	5,893	5·275	14·06	914	598
101·6 ,, 45 C. . . .	4·770	1,840	8,657	3·9	14·06	823	485
101·6 ,, 40 C. . . .	4·231	1,264	4,750	2·5	14·06	701	352
76·2 ,, 50 C. . . .	3·987	973	2,154	1·6	5·67	823	200
76·2 ,, 45 C. . . .	3·601	823	2,953	1·5	5·67	792	185

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A. B. BOFORS—GUNS AND MOUNTINGS

Tables corrected by the Manufacturers, January, 1937.

NAVAL GUNS AND MOUNTINGS.

		25 mm.	25 mm. double.	40 mm.	40 mm.	40 mm. double	75 mm.	75 mm.	75 mm. double	88 mm.	102 mm.	105 mm.	105 mm. double
System		Auto.	Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore	mm.	25	25	40	40	40	75	75	75	88	102	105	105
Length of Barrel	cal.	64	64	43	60	60	40	49	60	45	50	40	50
Weight of Gun	kg.	75	75	165	220	220	430	615	1,195	1,665	2,430	1,180	2,550
,, Projectile	kg.	0·250	0·250	0·955	0·955	0·955	6·5	6·5	6·5	10	14	16	16
Muzzle Velocity	m.s.	850	850	700	900	900	600	750	850	800	850	700	800
Range, max.	m.	5,500	5,500	7,800	8,500	8,500	11,800	14,300	16,000	16,000	18,300	14,600	18,200
Rounds per Minute		180	360	120	120	240	30	28	50	20	15	14	25
Weight of Gun, Mounting, and Shield	kg.	570	900	850	1,100	3,500	1,410	1,775	8,300	3,550	7,590	2,950	22,100
Weight of Shield	kg.	—	—	—	—	—	240	—	—	—	—	—	4,500
Angle of Elevation	deg.	90	90	90	90	90	40	80	90	40	80	32	85
,, Depression	deg.	10	10	10	10	10	10	5	10	10	10	10	10

NAVAL GUNS AND MOUNTINGS—*continued.*

		12 cm.	12 cm.	12 cm. double	15 cm.	15 cm.	15 cm. double	20·3 cm. double	25·4 cm. double	28 cm. double
Diameter of Bore	mm.	120	120	120	149·1	149·1	149·1	203	254	283
Length of Barrel	cal.	45	50	50	45	50	50	50	45	45
Weight of Gun	kg.	2,600	4,100	4,100	6,100	7,865	7,500	22,500	37,900	44,100
,, Projectile	kg.	21	24	24	46	46	46	115	225	305
Muzzle Velocity	m.s.	800	900	900	835	900	900	900	850	870
Range, max.	m.	19,300	19,500	19,500	19,600	24,500	24,500	28,000	30,300	25,000
Rounds per Minute		12	10	18	8	7	15	12	8	6
Weight of Gun, Mounting, and Shield	kg.	8,700	11,000	20,000	17,860	28,300	72,000	170,000	320,000	494,000
Weight of Shield	kg.	800	1,500	1,600	4,550	12,000	24,200	29,000	114,000	225,000
Angle of Elevation	deg.	45	30	30	30	60	60	45	45	20
,, Depression	deg.	10	10	10	10	10	10	5	10	5

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A.B. Bofors—Guns and Mountings. *Howitzers and Field Guns.*

		75 mm. Field.	75 mm. Field.	10.5 cm. Field Howr.	10·5 cm. Field.	15 cm. Field Howr.	15 cm. Field.	21 cm. Field Howr.
Diameter of Bore	mm.	75	75	105	105	149·1	149·1	216
Length of Barrel	cal.	40	46	22	42	24	43	14
Weight of Gun	kg.	365	400	495	1,200	1,825	4,200	2,780
,, Projectile	kg.	6·5	6·5	14	15·3	41	46	100
Muzzle Velocity	m.s.	625	710	500	785	580	775	475
Range, max.	m.	12,500	14,000	11,000	17,000	15,000	22,000	13,000
Rounds per Minute		25	25	12	10	6	4	3
Weight of Gun, Mounting and Shield	kg.	1,350	1,550	1,650	3,750	5,600	12,000	7,800
Angle of Elevation	deg.	45	45	45	45	45	45	70
,, Depression	deg.	5	5	5	3	5	2	6

		Tank Guns.		Infantry Guns.					Mountain Howitzers.	
				37–81 mm.		47–75 mm.				
		37 mm.	47 mm.	37 mm. Barrel.	81 mm. Barrel.	47 mm. Barrel.	75 mm. Barrel.	37 mm.	75 mm.	105 mm.
Diameter of Bore	mm.	37	47	37	81	47	75	37	75	105
Length of Barrel	cal.	45	33	45	20	33	20	45	22	12
Weight of Gun	kg.	105	105	144		130		103	256	290
,, Projectile	kg.	0·7	1·5	0·7	4·4	1·5	4·5	0·7	6·5	12
Muzzle Velocity	m.s.	800	560	800	320	560	300	800	470	300
Range, max.	m.	6,400	5,400	7,100	6,000	6,500	5,400	6,400	10,000	6,600
Rounds per Minute		30	30	25	20	25	20	30	25	12
Weight of Gun, Mounting and Shield	kg.	300	300	450		425		335	790	840
Angle of Elevation	deg.	25	25	80		60		25	50	40
,, Depression	deg.	10	10	8		5		10	10	10

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A.B. Bofors—Guns and Mountings. *Anti-Aircraft Guns.*

	25 mm. Fixed.	25 mm. Mobile.	40 mm. Fixed.	4o mm. Mobile.	75 mm. Mobile.	75 mm. Mobile.	75 mm. Fixed.	80 mm. Mobile.	102 mm. Fixed.	105 mm. Mobile.
System	Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore . . . mm.	25	25	40	40	75	75	75	80	102	105
Length of Barrel . . . cal.	64	64	60	60	50	52	60	50	50	44
Weight of Projectile . . kg.	0·250	0·250	0·955	0·955	6·5	6·5	6·5	8	14	16
Muzzle Velocity . . . . m.s.	850	900	900	900	750	840	850	750	850	750
Rounds per Minute	180	180	120	120	30	25	25	25	15	12
Weight of Gun and Mounting . . . . . kg.	500	1,020	900	2,000	2,600	4,000	3,400	4,000	7,000	6,200
Angle of Elevation . . . deg.	90	90	90	90	85	85	85	85	85	85
,, Depression. . . deg.	10	5	10	5	3	5	5	3	5	5

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BETHLEHEM STEEL CO.

SHIP AND COAST-DEFENCE GUNS.

Calibre.		Length of bore.	Weight of gun, including breech mechanism.		Weight of projectile.		At Muzzle. Velocity.		At Muzzle. Energy.		At Muzzle. Penetration of steel-plate (De Marre).		Type of Ammunition.
inches.	millimetres.	calibres.	lbs.	kgs.	lbs.	kgs.	ft. per sec.	metres per sec.	foot-tons.	metre-tons.	inches.	millimetres.	
1·457	37	about 50	160	72·5	1·07	0·48	2,150	655	34	10·5	2·04	51·8	Fixed in cartridge case.
1·850	47	about 50	550	249·5	3·3	1·5	2,400	732	132	41	4·11	104·4	,, ,,
2·244	57	50	960	435·5	6·07	2·75	2,400	732	243	75	5·17	131·3	,, ,,
3	76	50	1950	884·5	13	5·9	2,700	823	658	204	7·71	195·8	,, ,,
			tons.										
4	102	50	2·6	2,642	33	15	2,800	853	1,795	557	11·61	294·9	,, ,,
4	102	50	2·6	2,642	30·86	14	3,000	914	1,928	597	12·22	310·4	,, ,,
5	127	51	5·0	5,080	50	22·7	3,150	960	3,440	1,067	14·56	369·8	Separate, with powder in bag.
6	152	45	7·0	7,112	105	47·6	2,600	792	4,926	1,523	15·47	392·9	Separate, with cartridge case.
6	152	50	8·4	8,534	105	47·6	2,800	853	5,713	1,767	17·19	436·6	Separate, with powder in bag.
6	152	53	10·1	10,260	105	47·6	3,000	914	6,559	2,028	18·97	481·8	,, ,, ,,
7	178	45	12·7	12,900	165	74·8	2,700	823	8,348	2,584	19·11	485·4	,, ,, ,,
7	178	50	14·5	14,730	165	74·8	2,900	884	9,631	2,982	21·16	537·5	,, ,, ,,
8	203	45	18·6	18,900	260	118	2,800	853	14,148	4,379	24·15	613·4	,, ,, ,,
8	203	50	22·3	22,660	260	118	2,900	884	15,177	4,703	25·38	644·6	,, ,, ,,
9·2	234	50	30·4	30,890	380	172	2,900	884	22,181	6,856	28·66	727·9	,, ,, ,,
10	254	45	35·4	35,970	515	234	2,800	853	28,023	8,685	30·97	786·6	,, ,, ,,
10	254	50	43·9	44,600	515	234	2,900	884	30,061	9,327	32·56	827·0	,, ,, ,,
12	305	45	53·8	54,660	870	395	2,800	853	47,341	14,660	37·05	941·1	,, ,, ,,
12	305	50	57·5	58,400	870	395	2,900	884	50,783	15,745	38·95	989·3	,, ,, ,,
14	356	45	64·6	65,650	1,400	635	2,600	792	65,687	20,317	39·69	1008·0	,, ,, ,,
14	356	50	79·4	80,700	1,400	635	2,800	853	76,181	23,567	44·12	1121	,, ,, ,,
15	381	45	86·5	87,880	1,700	771	2,600	792	79,763	24,668	42·35	1076	,, ,, ,,
16	406	45	105·0	106,500	2,100	953	2,600	792	98,530	30,491	45·95	1167	,, ,, ,,
16	406	50	128·0	130,200	2,100	953	2,800	853	114,272	35,369	51·08	1297	,, ,, ,,
16	406	50	140·0	142,400	2,330	1,057	2,700	823	117,900	36,500	52·39	1331	,, ,, ,,
18	457	45	150·0	152,400	3,330	1,510	2,450	747	138,734	42,979	51·71	1313	,, ,, ,,

Guns of 4·7-in. calibre and under, equipped with the wedge-type breech mechanism, are supplied with an automatic breech-opening device, if desired.

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UNITED STATES NAVAL ORDNANCE.

GUN.	MARK.	Length in Calibres.	Total Length.	Capacity of Chamber in Cubic Inches.	Travel of Projectile in Inches.	Weight of Gun.	Weight of Projectile.	Weight of Charge.	Muzzle Velocity.	Muzzle Energy.	Penetration at Muzzle, Krupp Armour, using Capped Projectile.
			inch.			tons.	lb.	lb.	ft.-seconds.	ft.-tons.	inch.
3-in. S.A.	V., VI.	50	159	219	128·3	1·0	13	3·85	2700	658	3·3
4-in. R.F.G.	III., IV., V., VI.	40	164	331	134·5	1·5	33	4·85	2000	915	3·4
4-in. R.F.G.	VII.	50	205	652	168·3	2·6	33	9·0	2500	1,430	4·6
4-in. R.F.G.	VIII.‡	50	205	652	168·3	2·9	33	12·3	2800	1,794	5·3
5-in. R.F.G.	II., III., IV.	40	206	656	167·8	3·1	50	10·0	2300	1,845	5·3
5-in. B.L.R.	V., VI.	50	256	1,200	215·6	4·6	60	19·2	2700	3,032	6·2
5-in. B.L.R.	VI.	50	256	1,200	215·6	4·6	50	20·5	3000	3,122	6·4
5-in. R.F.G.	VII.†	51	261	1,135	215·6	5·0	50	23·8	3150	3,439	6·8
6-in. R.F.G.	II., III.	30	196	1,318	145·4	4·8	105	18·8	1950	2,768	5·3
6-in. R.F.G.	IV., VII.	40	256	1,320	205·8	6·0	105	18·8	2150	3,365	6·0
6-in. R.F.G.	IX.	45	270	1,320	221·7	7·0	105	18·8	2250	3,685	6·3
6-in. B.L.R.	VI.	50	300	2,101	247·5	8·3	105	30·0	2600	4,920	8·0
6-in. B.L.R.	VIII.	50	300	2,101	247·5	8·6	105	37·0	2800	5,707	8·3
7-in. B.L.R.	II.	45	323	3,643	259·8	12·7	165	58·0	2700	8,338	9·6
8-in. B.L.R.	III., IV.	35	305	3,170	245·8	13·1	260	43·8	2100	7,948	8·6
8-in. B.L.R.	V.	40	343	5,243	273·1	18·1	260	78·0	2500	11,264	10·6
8-in. B.L.R.	VI.	45	369	5,243	299·1	18·7	260	98·5	2750	13,360	12·0
10-in. B.L.R.	I., II.	30	329	6,779	251·1	25·1	510	90·0	2000	14,141	10·7
10-in. B.L.R.	III.	40	413	10,222	327·0	34·6	510	207·5	2700	25,772	15·6
12-in. B.L.R.	I., II.	35	441	11,991	345·2	45·3	870	160·0	2100	26,596	14·2
12-in. B.L.R.	III., IV.	40	493	17,096	392·2	52·1	870	237·5	2400	34,738	16·8
12-in. B.L.R.	III., IV.	40	493	17,096	392·2	52·1	870	305·0	2600	40,768	18·5
12-in. B.L.R.	V.	45	553	16,974	452·0	52·9	870	305·0	2700	43,964	19·4
12-in. B.L.R.	VI.	45	553	14,970	452·0	53·6	870	340·0	2850	48,984	20·8
12-in. B.L.R.	VII.	50	607	14,296	506·3	56·1	870	340·0	2950	52,483	21·7
13-in. B.L.R.	I., II.	35	479	15,068	374·9	61·4	1130	180·0	2000	31,333	15·0
14-in. B.L.R.	I.	45	642	..	..	63·6	1400	365·0	2600	65,606	39·7*
14-in. B.L.R.	II.	50	700	..	..	82·2	1400	..	2800	76,180	44·1
16-in. B.L.R.	..	45	..	..	..	105·0	2100		2006	98,500	45·95
16-in. B.L.R.	..	50	..	..	..	130·0	2100		2800	114,270	51·08

* De Marre formula.

† All battleships from the Delaware class onward have this gun for torpedo defence.

‡ There is now a 4-in. 50-cal. anti-aircraft gun.

The U.S. Navy has a 5-in. 25-calibre A.A. gun; a 6-in. 53-calibre gun; and an 8-in. 55-calibre gun, but complete details are not yet published.

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STATEMENT ACCOMPANYING FIRST SUPPLEMENTARY NAVY ESTIMATE, 1936.

In my statement accompanying the original Navy Estimates for 1936, I explained that those Estimates made provision for the ordinary maintenance, repairs, and ancillary services of the Fleet, for progress with the new construction already authorised, for proceeding with the modernisation of existing Capital Ships and equipment of the Fleet Air Arm in accordance with announcements already made, and for expenditure on repairing deficiencies included in the programme referred to in the White Paper laid before Parliament in March, 1935 (Cmd. 4827), with certain additions that had been approved as part of the special measures taken in connection with the Italo-Ethiopian dispute. I added that no provision had been included for the New Construction Programme for 1936 or for the additional expenditure which would result from the further proposals for making good deficiencies which had recently been under consideration by H.M. Government and which were referred to in the White Paper of the 3rd March, 1936 (Cmd. 5107).

The Supplementary Estimate which I now present makes provision for commencing the New Construction Programme proposed for 1936, for additional expenditure on equipment, reserves and defence measures required for the Navy in pursuance of the policy explained in the White Paper of the 3rd March (Cmd. 5107) and for the continuance of expenditure necessitated by the Italo-Ethiopian situation.

The New Construction Programme proposed for 1936 is as follows :—

2 Capital Ships.
5 Cruisers (2 of the " Southampton " class and 3 of a smaller type, probably about 5,000 tons, for work with the main fleet).
9 Destroyers of the " Tribal " Class.
1 Aircraft Carrier.
4 Submarines (1 Minelaying Submarine, 1 Patrol type and 2 of a smaller type).
6 Sloops (3 Sloop Minesweepers, 2 Convoy Escorts, 1 Coastal Sloop).
1 River Gunboat.
2 small Surveying Vessels.
2 Special Service Vessels.
6 Motor Torpedo Boats (formerly called Coastal Motor Boats).
Small Craft (Boom Defence Vessels, Motor Vessels, Trawlers, Tugs, &c.).

For many years past it has been usual to provide only a nominal sum of less than £100,000 for commencing a new programme, and

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to order the ships towards the end of the financial year. The present Supplementary Estimate provides a sum of nearly £3,000,000 for commencing the new programme detailed above, the increase being required partly on account of the increased size of the programme and partly in order that ships may be laid down earlier in the financial year.

The Supplementary Estimate also makes provision for important improvements in our stock of ammunition, fuel and many other essential stores, and in the equipment of the Fleet.

Considerable further progress in the re-equipment of the existing Flights of the Fleet Air Arm with new type aircraft is also provided for.

It has further been decided to accelerate considerably the supply of additional anti-aircraft guns to existing ships, and provision for this purpose is included in the Supplementary Estimate and will be continued in future years.

The Supplementary Estimate provides also under Vote 8 for expenditure consequent on a decision, recently arrived at, that the four Cruisers of the "Hawkins" Class shall be retained in service. These Cruisers, which are at present armed with 7·5″ guns, were classed as 8″ Cruisers under the London Naval Treaty of 1930, and were accordingly due to be scrapped by the 31st December, 1936, in order to bring our 8″ Cruiser tonnage within the prescribed limit. It has now been decided, and the other signatory Powers have been informed, that instead of these four vessels being scrapped, three of them will have their 7·5″ guns replaced by guns of a calibre less than 6·1″ and will be retained as part of our future "Cruiser (b)" tonnage, while the fourth will be demilitarised and used as a Cadets' Training Ship.

The Estimate, moreover, provides under Vote 8 for equipping the old Aircraft Carrier Argus as a "Queen Bee Tender" and Training Aircraft Carrier. The need of such a vessel has long been recognised in the Fleet.

The requirements of the Naval Base at Singapore have been carefully reviewed and additional works and facilities have been decided to be necessary. The Total Estimate for the Work has accordingly been increased from £8,693,000 to £10,661,000.

Other important works the commencement of which is provided for in these Estimates are—

> A new Boys' Training Establishment in the Rosyth District, which is necessary in consequence of the congestion in all the existing Training Establishments.
>
> Alterations to one of the Dry Docks at Plymouth and Gibraltar respectively, in order to meet the requirements of the largest ships of the Fleet.
>
> Increased storage at R.N. Armament Depots, and also increased storage for Oil Fuel.

As foreshadowed in the Statement relating to Defence, a further increase of Vote A, Part I, is necessary, bringing the maximum numbers to be borne up to the 31st March, 1937, to a figure of

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101,154, an increase of between 6,000 and 7,000 above the maximum for 1935 as originally voted.

The allocation of the extra expenditure (the net total of which is reduced by the surplus indicated on Appropriations-in-Aid), is as follows :—

——	Gross Total.	Appropriations-in-Aid.	Net Total.
	£	£	£
(1) Continuation of special measures	2,117,000	—	2,117,000
(2) New Programme of Naval Construction . . .	2,881,500	—	2,881,500
(3) Other services . . .	5,371,100	69,600	5,301,500
£	10,369,600	69,600	10,300,000

A revised Programme Statement is appended to the Supplementary Estimate showing the effect upon the current Programme of Shipbuilding, etc.

MONSELL.

28th April, 1936.

1936.

STATEMENT showing the FURTHER SUMS required under the several VOTES concerned and the REVISED TOTAL of the ESTIMATES for the YEAR.

Vote.	——	Original Estimate.	Supplementary Estimate now proposed.		Revised Estimate.
			Additional Charges.	Appropriations-in-Aid (+ more or − less).	
		£	£	£	£
1	Net estimate . .	13,572,700	42,500	+ 4,500	13,610,700
2	,, ,, . .	3,400,000	185,700	—	3,585,700
3	,, ,, . .	384,500	12,800	—	397,300
4	,, ,, . .	3,066,000	506,000	—	3,572,000
5	,, ,, . .	204,000	1,000	—	205,000
6	,, ,, . .	492,000	21,600	—	513,600
7	,, ,, . .	350,700	5,000	—	355,700
8. I	,, ,, . .	7,072,000	731,400	—	7,803,400
8. II	,, ,, . .	5,752,300	4,005,800	+ 50,100	9,708,000
8. III	,, ,, . .	14,441,000	2,067,130	—	16,508,130
9	,, ,, . .	7,115,300	2,213,000	—	9,328,300
10	,, ,, . .	2,450,500	375,700	+ 15,000	2,811,200
11	,, ,, . .	721,300	102,870	—	824,170
12	,, ,, . .	1,183,000	99,100	—	1,282,100
13	,, ,, . .	3,219,000	—	—	3,219,000
14	,, ,, . .	5,276,000	—	—	5,276,000
15	,, ,, . .	1,229,700	—	—	1,229,700
Total Navy Estimates :—					
	Gross Total . . .	72,720,126	10,369,600	—	83,089,726
	Appropriations-in-Aid .	2,790,126	—	+ 69,600	2,859,726
	Net Total . . .	69,930,000	—	—	80,230,000

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STATEMENT ACCOMPANYING SECOND SUPPLEMENTARY NAVY ESTIMATE, 1936.

In his statement accompanying the original Navy Estimates for 1936 (Cmd. 5105), my predecessor explained that those Estimates included no provision for the New Construction Programme for 1936.

Provision for that Programme was made in the Supplementary Navy Estimate presented on the 28th April, 1936, and the Programme was detailed in the Statement accompanying that Estimate.

In the Statement relating to Defence (Cmd. 5107) it was explained that, to render the Navy capable in all circumstances of fulfilling its functions, it would be necessary to proceed with new construction at a more rapid rate than in recent years. It was also emphasised that the defence plans envisaged therein must of necessity be flexible and would no doubt require adjustment from time to time.

Since the presentation of the Supplementary Navy Estimate, which provided for a first instalment of the new construction necessary to implement these plans, further consideration has been given both to the amount of new construction which it is possible to undertake and also to the rate at which ships laid down can be completed.

As the result of this further consideration it is proposed to add to the Programme of 1936 the following ships :—

2 Cruisers (about 5,000 tons), making 7 Cruisers in all.
1 Leader and 8 Destroyers, making 18 vessels in all.
1 Aircraft Carrier, making 2 in all.
4 Submarines (3 Patrol type and 1 of a smaller type), making 8 Submarines in all.

The total cost of these additions to the Programme is estimated to be £11,015,000 and the expenditure in the current financial year £150,000.

In addition it has been found possible to accelerate certain ships of the existing Programme and to make earlier provision for certain material at an estimated additional cost of £759,000. The revised figures for new construction are shown in a separate Programme statement appended. Provision is also made under two new Subheads for £150,000 for extensions of plant and works for the manufacture of armour, guns, &c., at contractors' works.

Samuel Hoare.

Admiralty.
7 July, 1936.

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1936.

STATEMENT showing the FURTHER SUMS required under the several VOTES concerned and the REVISED TOTAL of the ESTIMATES for the YEAR.

Vote.	——	Original and Supplementary Estimates.	Supplementary Estimate now proposed.	Revised Estimate.
		£	£	£
1	Net estimate . . .	13,610,700	—	13,610,700
2	,, ,, . . .	3,585,700	—	3,585,700
3	,, ,, . . .	397,300	—	397,300
4	,, ,, . . .	3,572,000	—	3,572,000
5	,, ,, . . .	205,000	—	205,000
6	,, ,, . . .	513,600	—	513,600
7	,, ,, . . .	355,700	—	355,700
8. I	,, ,, . . .	7,803,400	13,300	7,816,700
8. II	,, ,, . . .	9,708,000	10,600	9,718,600
8. III	,, ,, . . .	16,508,130	890,100	17,398,230
9	,, ,, . . .	9,328,300	145,000	9,473,300
10	,, ,, . . .	2,811,200	—	2,811,200
11	,, ,, . . .	824,170	—	824,170
12	,, ,, . . .	1,282,100	—	1,282,100
13	,, ,, . . .	3,219,000	—	3,219,000
14	,, ,, . . .	5,276,000	—	5,276,000
15	,, ,, . . .	1,229,700	—	1,229,700
Total Navy Estimates :—				
	Gross Total	83,089,726	1,059,000	84,148,726
	Appropriations-in-Aid . .	2,859,726	—	2,859,726
	Net Total	80,230,000	1,059,000	81,289,000

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THIRD SUPPLEMENTARY ESTIMATE, 1936.

March 1, 1937.

VOTE A

NUMBERS of OFFICERS, SEAMEN, BOYS and ROYAL MARINES, Borne on the Books of His Majesty's Ships, at the Royal Marine Divisions and at Royal Air Force Establishments.

REVISED ESTIMATE	102,154(*a*)
ORIGINAL AND SUPPLEMENTARY ESTIMATES	101,154
ADDITIONAL NUMBERS REQUIRED	1,000

(*a*) Maximum bearing.

I.—ESTIMATE of the further Sum which will be required during the Year ending March 31, 1937, to meet charges to NAVY VOTES which were not provided for in the ESTIMATES of the YEAR.

One Hundred Pounds.

(£100)

EXPLANATION.

In regard to Vote A, it is desired to take advantage of the favourable recruiting situation to enter additional numbers towards the end of the current financial year, thus reducing the numbers to be recruited in the financial year 1937. The financial effect on Navy Votes of the additional numbers to be provided for in the current financial year is negligible.

Additional funds are required primarily to meet the cost, falling in the current year, of the following services :—

(i) Increases in bonus granted to Admiralty industrial employees, with effect from July last, amounting to £230,000.

(ii) Purchase and adaptation of H.M.S. Caledonia (late S.S. Majestic) as an accommodation ship for Boys and Artificer Apprentices at Rosyth, amounting to £366,000.

(iii) Additional requirements for Works Services due to the development of the Naval Defence Programme, amounting to £414,500.

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The surplus receipts of £400,000, which it is proposed to apply towards requirements, arise from the transfer of two destroyers to the Government of Canada on repayment. The balance of requirements can be met from savings on other services, largely on the Vote for Naval Armaments.

The following variations have been made in the Shipbuilding Programme for the current financial year :—

Add—
One Accommodation Ship (H.M.S. Caledonia).
One Motor Torpedo Boat.

Abate—
One Destroyer (" J " Class).
One Tug.

STANLEY
R. H. A. CARTER, } *Secretaries.*

ADMIRALTY,
1 March, 1937.

1936

STATEMENT showing the FURTHER SUMS required under the several VOTES concerned and the REVISED TOTAL of the ESTIMATES for the YEAR.

Vote.	—	Original and Supplementary Estimates.	Supplementary Estimate now proposed.		Revised Estimate.
			Additional Charges.	Appropriations-in-Aid (+ more or − less).	
		£	£	£	£
1	Net estimate .	13,610,700	—	—	13,610,700
2	,, ,, .	3,585,700	—	—	3,585,700
3	,, ,, .	397,300	—	—	397,300
4	,, ,, .	3,572,000	—	—	3,572,000
5	,, ,, .	205,000	—	—	205,000
6	,, ,, .	513,600	—	—	513,600
7	,, ,, .	355,700	—	—	355,700
8. I	,, ,, .	7,816,700	150,000	—	7,966,700
8. II	,, ,, .	9,718,600	—	+ 400,000	9,318,600
8. III	,, ,, .	17,398,230	216,000	—	17,614,230
9	,, ,, .	9,473,300	*Cr.* 380,400	—	9,092,900
10	,, ,, .	2,811,200	414,500	—	3,225,700
11	,, ,, .	824,170	—	—	824,170
12	,, ,, .	1,282,100	—	—	1,282,100
13	,, ,, .	3,219,000	—	—	3,219,000
14	,, ,, .	5,276,000	—	—	5,276,000
15	,, ,, .	1,229,700	—	—	1,229,700
Total Navy Estimates :—					
Gross Total . . .		84,148,726	400,100	—	84,548,826
Appropriations-in-Aid .		2,859,726	—	+ 400,000	3,259,726
Net Total . . .		81,289,000	—	—	81,289,100

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CONVENTION REGARDING THE RÉGIME OF THE STRAITS.

SIGNED AT MONTREUX, JULY 20, 1936.

(Cmd. 5249.)

ARTICLE 1.

The High Contracting Parties recognise and affirm the principle of freedom of transit and navigation by sea in the Straits.

The exercise of this freedom shall henceforth be regulated by the provisions of the present Convention.

Section I.—*Merchant Vessels.*

ARTICLE 2.

In time of peace, merchant vessels shall enjoy complete freedom of transit and navigation in the Straits, by day and by night, under any flag and with any kind of cargo, without any formalities, except as provided in article 3 below. No taxes or charges other than those authorised by Annex I to the present Convention shall be levied by the Turkish authorities on these vessels when passing in transit without calling at a port in the Straits.

. . . . . .

Pilotage and towage remain optional.

ARTICLE 3.

(Contains quarantine and sanitary regulations.)

ARTICLE 4.

In time of war, Turkey not being belligerent, merchant vessels, under any flag or with any kind of cargo, shall enjoy freedom of transit and navigation in the Straits subject to the provisions of articles 2 and 3.

Pilotage and towage remain optional.

ARTICLE 5.

In time of war, Turkey being belligerent, merchant vessels not belonging to a country at war with Turkey shall enjoy freedom of transit and navigation in the Straits on condition that they do not in any way assist the enemy.

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Such vessels shall enter the Straits by day and their transit shall be effected by the route which shall in each case be indicated by the Turkish authorities.

ARTICLE 6.

Should Turkey consider herself to be threatened with imminent danger of war, the provisions of article 2 shall nevertheless continue to be applied except that vessels must enter the Straits by day and that their transit must be effected by the route which shall, in each case, be indicated by the Turkish authorities.

Pilotage may, in this case, be made obligatory, but no charge shall be levied.

ARTICLE 7.

The term " merchant vessels " applies to all vessels which are not covered by Section II of the present Convention.

Section II.—*Vessels of War.*

ARTICLE 8.

For the purposes of the present Convention, the definitions of vessels of war and of their specification together with those relating to the calculation of tonnage shall be as set forth in Annex II to the present Convention.

(NOTE.—The definitions and specifications contained in Annex II are taken from the London Naval Treaty, 1936.)

ARTICLE 9.

Naval auxiliary vessels specifically designed for the carriage of fuel, liquid or non-liquid, shall not be subject to the provisions of article 13 regarding notification, nor shall they be counted for the purpose of calculating the tonnage which is subject to limitation under articles 14 and 18, on condition that they shall pass through the Straits singly. They shall, however, continue to be on the same footing as vessels of war for the purpose of the remaining provisions governing transit.

The auxiliary vessels specified in the preceding paragraph shall only be entitled to benefit by the exceptional status therein contemplated if their armament does not include : for use against floating targets, more than two guns of a maximum calibre of 105 millimetres ; for use against aerial targets, more than two guns of a maximum calibre of 75 millimetres.

ARTICLE 10.

In time of peace, light surface vessels, minor war vessels and auxiliary vessels, whether belonging to Black Sea or non-Black Sea Powers, and whatever their flag, shall enjoy freedom of transit through the Straits without any taxes or charges whatever, provided that such transit is begun during daylight and subject to the conditions laid down in article 13 and the articles following thereafter.

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Vessels of war other than those which fall within the categories specified in the preceding paragraph shall only enjoy a right of transit under the special conditions provided by articles 11 and 12.

Article 11.

Black Sea Powers may send through the Straits capital ships of a tonnage greater than that laid down in the first paragraph of article 14, on condition that these vessels pass through the Straits singly, escorted by not more than two destroyers.

Article 12.

Black Sea Powers shall have the right to send through the Straits, for the purpose of rejoining their base, submarines constructed or purchased outside the Black Sea, provided that adequate notice of the laying down or purchase of such submarines shall have been given to Turkey.

Submarines belonging to the said Powers shall also be entitled to pass through the Straits to be repaired in dockyards outside the Black Sea on condition that detailed information on the matter is given to Turkey.

In either case, the said submarines must travel by day and on the surface, and must pass through the Straits singly.

Article 13.

The transit of vessels of war through the Straits shall be preceded by a notification given to the Turkish Government through the diplomatic channel. The normal period of notice shall be eight days; but it is desirable that in the case of non-Black Sea Powers this period should be increased to fifteen days. The notification shall specify the destination, name, type and number of the vessels, as also the date of entry for the outward passage and, if necessary, for the return journey. Any change of date shall be subject to three days' notice.

Entry into the Straits for the outward passage shall take place within a period of five days from the date given in the original notification. After the expiry of this period, a new notification shall be given under the same conditions as for the original notification.

When effecting transit, the commander of the naval force shall, without being under any obligation to stop, communicate to a signal station at the entrance to the Dardanelles or the Bosphorus the exact composition of the force under his orders.

Article 14.

The maximum aggregate tonnage of all foreign naval forces which may be in course of transit through the Straits shall not exceed 15,000 tons, except in the cases provided for in article 11 and in Annex III to the present Convention.

The forces specified in the preceding paragraph shall not, however, comprise more than nine vessels.

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Vessels, whether belonging to Black Sea or non-Black Sea Powers, paying visits to a port in the Straits, in accordance with the provisions of article 17, shall not be included in this tonnage.

Neither shall vessels of war which have suffered damage during their passage through the Straits be included in this tonnage; such vessels, while undergoing repair, shall be subject to any special provisions relating to security laid down by Turkey.

Article 15.

Vessels of war in transit through the Straits shall in no circumstances make use of any aircraft which they may be carrying.

Article 16.

Vessels of war in transit through the Straits shall not, except in the event of damage or peril of the sea, remain therein longer than is necessary for them to effect the passage.

Article 17.

Nothing in the provisions of the preceding articles shall prevent a naval force of any tonnage or composition from paying a courtesy visit of limited duration to a port in the Straits, at the invitation of the Turkish Government. Any such force must leave the Straits by the same route as that by which it entered, unless it fulfils the conditions required for passage in transit through the Straits as laid down by articles 10, 14 and 18.

Article 18.

(1) The aggregate tonnage which non-Black Sea Powers may have in that sea in time of peace shall be limited as follows:—

(*a*) Except as provided in paragraph (*b*) below, the aggregate tonnage of the said Powers shall not exceed 30,000 tons;

(*b*) If at any time the tonnage of the strongest fleet in the Black Sea shall exceed by at least 10,000 tons the tonnage of the strongest fleet in that sea at the date of the signature of the present Convention, the aggregate tonnage of 30,000 tons mentioned in paragraph (*a*) shall be increased by the same amount, up to a maximum of 45,000 tons. For this purpose, each Black Sea Power shall, in conformity with Annex IV to the present Convention, inform the Turkish Government, on the 1st January and the 1st July of each year, of the total tonnage of its fleet in the Black Sea; and the Turkish Government shall transmit this information to the other High Contracting Parties and to the Secretary-General of the League of Nations.

(*c*) The tonnage which any one non-Black Sea Power may have in the Black Sea shall be limited to two-thirds of the aggregate tonnage provided for in paragraphs (*a*) and (*b*) above;

(*d*) In the event, however, of one or more non-Black Sea Powers

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desiring to send naval forces into the Black Sea, for a humanitarian purpose, the said forces, which shall in no case exceed 8,000 tons altogether, shall be allowed to enter the Black Sea without having to give the notification provided for in article 13 of the present Convention, provided an authorisation is obtained from the Turkish Government in the following circumstances: if the figure of the aggregate tonnage specified in paragraphs (*a*) and (*b*) above has not been reached and will not be exceeded by the despatch of the forces which it is desired to send, the Turkish Government shall grant the said authorisation within the shortest possible time after receiving the request which has been addressed to it; if the said figure has already been reached or if the despatch of the forces which it is desired to send will cause it to be exceeded, the Turkish Government will immediately inform the other Black Sea Powers of the request for authorisation, and if the said Powers make no objection within twenty-four hours of having received this information, the Turkish Government shall, within forty-eight hours at the latest, inform the interested Powers of the reply which it has decided to make to their request.

Any further entry into the Black Sea of naval forces of non-Black Sea Powers shall only be effected within the available limits of the aggregate tonnage provided for in paragraphs (*a*) and (*b*) above.

(2) Vessels of war belonging to non-Black Sea Powers shall not remain in the Black Sea more than twenty-one days, whatever be the object of their presence there.

Article 19.

In time of war, Turkey not being belligerent, warships shall enjoy complete freedom of transit and navigation through the Straits under the same conditions as those laid down in articles 10 to 18.

Vessels of war belonging to belligerent Powers shall not, however, pass through the Straits except in cases arising out of the application of article 25 of the present Convention, and in cases of assistance rendered to a State victim of aggression in virtue of a treaty of mutual assistance binding Turkey, concluded within the framework of the Covenant of the League of Nations, and registered and published in accordance with the provisions of article 18 of the Covenant.

In the exceptional cases provided for in the preceding paragraph, the limitations laid down in articles 10 to 18 of the present Convention shall not be applicable.

Notwithstanding the prohibition of passage laid down in paragraph 2 above, vessels of war belonging to belligerent Powers, whether they are Black Sea Powers or not, which have become separated from their bases, may return thereto.

Vessels of war belonging to belligerent Powers shall not make any capture, exercise the right of visit and search, or carry out any hostile act in the Straits.

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Article 20.

In time of war, Turkey being belligerent, the provisions of articles 10 to 18 shall not be applicable; the passage of warships shall be left entirely to the discretion of the Turkish Government.

Article 21.

Should Turkey consider herself to be threatened with imminent danger of war she shall have the right to apply the provisions of article 20 of the present Convention.

Vessels which have passed through the Straits before Turkey has made use of the powers conferred upon her by the preceding paragraph, and which thus find themselves separated from their bases, may return thereto. It is, however, understood that Turkey may deny this right to vessels of war belonging to the State whose attitude has given rise to the application of the present article.

Should the Turkish Government make use of the powers conferred by the first paragraph of the present article, a notification to that effect shall be addressed to the High Contracting Parties and to the Secretary-General of the League of Nations.

If the Council of the League of Nations decide by a majority of two-thirds that the measures thus taken by Turkey are not justified, and if such should also be the opinion of the majority of the High Contracting Parties signatories to the present Convention, the Turkish Government undertakes to discontinue the measures in question as also any measures which may have been taken under article 6 of the present Convention.

Article 22.

(Contains quarantine and sanitary regulations.)

Section III.—*Aircraft.*

Article 23.

(Turkey to lay down a route which civil aircraft may follow.)

Section IV.—*General Provisions.*

Article 24.

(Turkey to take over the functions of the former Straits Commission.)

Article 25.

Nothing in the present Convention shall prejudice the rights and obligations of Turkey, or of any of the other High Contracting Parties members of the League of Nations, arising out of the Covenant of the League of Nations.

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Section V.—*Final Provisions.*

Article 26.

The present Convention shall be ratified as soon as possible.

(Procedure for its coming into force on ratification follows.)

Article 27.

The present Convention shall, as from the date of its entry into force, be open to accession by any Power signatory to the Treaty of Peace at Lausanne signed on the 24th July, 1923.

Each accession shall be notified, through the diplomatic channel, to the Government of the French Republic, and by the latter to all the High Contracting Parties.

Accessions shall come into force as from the date of notification to the French Government.

Article 28.

The present Convention shall remain in force for twenty years from the date of its entry into force.

The principle of freedom of transit and navigation affirmed in article 1 of the present Convention shall however continue without limit of time.

If, two years prior to the expiry of the said period of twenty years, no High Contracting Party shall have given notice of denunciation to the French Government the present Convention shall continue in force until two years after such notice shall have been given. Any such notice shall be communicated by the French Government to the High Contracting Parties.

In the event of the present Convention being denounced in accordance with the provisions of the present Article, the High Contracting Parties agree to be represented at a conference for the purpose of concluding a new Convention.

Article 29.

At the expiry of each period of five years from the date of the entry into force of the present Convention each of the High Contracting Parties shall be entitled to initiate a proposal for amending one or more of the provisions of the present Convention.

(Procedure for amendment follows.)

Annex I contains regulations for sanitary and light dues.

Annex II contains definitions of "standard tonnage" and of "categories" of warships, taken from the London Naval Treaty of 1936.

Annexes III and IV contain miscellaneous provisions arising out of Annex II.

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STATEMENT RELATING TO DEFENCE EXPENDITURE.

Presented by the Prime Minister to Parliament by Command of His Majesty, February, 1937 (Cmd. 5374).

I.

In the statement made in the House of Commons on the 11th February, the Chancellor of the Exchequer explained that, while defence expenditure during the ensuing years could not equitably be met entirely from revenue, and must in part rest on appropriations from capital, neither the total amount which must be raised from capital, nor the total period over which such capital expenditure must be spread, could at present be predicted.

2. Constitutional usage requires that the Bill now proposed to be introduced should specify upward limits which cannot be exceeded except by further statutory authority. The authority which His Majesty's Government seek for the issue of sums not exceeding in the aggregate £400 millions, to be applied as appropriations in aid of the moneys provided by Parliament for the Defence Services over the five years from 1st April, 1937, to 31st March, 1942, does not imply that the whole of this sum will in fact be raised. The figure of £400 millions represents the maximum aggregate sum to be provided from borrowed moneys or from the Old Sinking Fund towards the total cost of Defence which Parliament will be asked to authorise. The whole Defence programme will, however, remain flexible and will be subject to such modification as circumstances may demand. If conditions should permit, the programme will be curtailed or its execution will be spread over a longer period. If events, which cannot now be foreseen, should show that amendment is called for, either in the maximum amount or in the period of years specified in the proposed Resolution, the necessary measures will be submitted to Parliament.

3. In the meantime, as explained in the Memorandum dated the 11th February on the proposed Resolution (Cmd. 5368), Parliament will retain full control over Defence expenditure. The whole of such proposed expenditure will continue to be shown in the Estimates laid before the House of Commons, and will be subject to the normal methods of Parliamentary scrutiny and authorisation. It will also be provided that the sums which may be appropriated in aid of Defence expenditure under the Bill must not in the course of any financial year exceed the sums shown in the Estimates laid in connection with the Votes approved by the House of Commons by Resolution in Supply.

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II.

Growth in Complexity and Cost of New Armaments Generally.

4. In the White Paper presented to Parliament in March, 1936, (Cmd. 5107) an outline was given of the objectives aimed at, with an indication of the principal measures necessary for the reconditioning of our forces, as part of the co-ordinated plan which had been drawn up. As that paper shows, great importance has from the outset been attached to dealing with the problems of Defence by elastic means susceptible of adaptation in the light of changes in world conditions and of the new needs which arise from the intensive application of scientific research and invention to the problems of Defence.

5. The essential features of the White Paper of March, 1936, remain unchanged, although certain measures of acceleration have been approved by Parliament. On the present occasion, therefore, it is unnecessary to repeat in detail the information given a year ago on the programme of His Majesty's Government. Rather the opportunity is taken to indicate the width of the field necessarily covered by the Defence programme in consequence of the extent of the deficiencies to be made good, the underlying strategic requirements and the changing conditions of modern warfare.

6. Recent years have witnessed an immense elaboration of the mechanical equipment of Fighting Services in many countries. Modern forces, whether on land, at sea, or in the air, must, if they are to be effective, be provided with arms and defences more ingenious and formidable and far more costly than any conceived a generation ago. Moreover, it is not sufficient to equip a force in the first instance ; it must be assured also of the swift and steady replacement of its equipment and supplies as war proceeds. This is a circumstance which has a most important bearing on the cost of the Defence programme.

7. The growth in the destructive powers of Air Forces and their increasing range compel the adoption of a whole system of new measures, necessarily involving heavy cost, for air defence at home and overseas and for the protection of the civil population.

8. While the necessity for modern equipment and for protection against air attack is common to many nations, the wide dispersal of the territories comprised within the British Empire and the dependence of these islands upon supplies from overseas lay a special responsibility upon British Forces and, above all, upon the Navy to preserve the freedom of communication overseas, which is vital to our existence. The modernisation of the defences of strategic points in various parts of the Empire is, in itself, a formidable item in the cost of the Defence programme.

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III.

The Navy.

9. There is no need to amplify the statement of the Navy's functions contained in the White Papers presented to Parliament in 1935 and 1936 (Cmd. 4827 and 5107). Heavy expenditure must be incurred over the next few years if the Navy is to be brought up to the strength necessary to ensure that it will be in a position to perform these functions.

10. New construction constitutes one of the main heads of this expenditure. In normal times it is of great advantage to arrange new construction programmes so as to ensure that the number of new vessels of each type to be laid down shall be approximately the same in each year. If this plan can be followed the costs of construction are spread evenly, and the Navy never finds itself at any time in the position that an undue proportion of the fleet consists of old or obsolescent ships.

11. In present cirumstances, however, an even spread of new building is impossible, and for some years the country will be constrained to undertake a series of heavy building programmes. The main reasons for this course are, first, that a considerable number of our existing ships are war-built and are, or will shortly become, over-age, and second, that no vessels of certain types were built for a number of the years immediately after the war.

12. Of our fifteen capital ships, only three are of post-war construction. Until the expiry of the London Naval Treaty on the 31st December, 1936, it was not possible to lay down any new vessels of this class. Two such ships (costing approximately £8,000,000 each) were included in the 1936 new construction programme, and preliminary steps have been taken which will permit of the ordering of three further capital ships early in the financial year 1937–8 as part of the new construction programme for that year, as soon as that programme has received Parliamentary authority.

13. In regard to cruisers, it was stated in the White Paper of March last that our aim was to increase the total from about 50 to 70, of which 60 would be under-age and 10 over-age, and that 5 cruisers would be included in the 1936 programme. Later, a measure of acceleration was deemed necessary, and the number of cruisers in the 1936 programme was raised to 7. It is anticipated that 7 will be included in the 1937 programme.

14. Some acceleration was also decided upon in the construction of aircraft carriers. Two of these vessels, instead of one as originally contemplated, were laid down in 1936, and two further vessels of this type will probably be included in the 1937 programme.

15. The result of this increased building programme upon Navy Estimates may be indicated by a consideration of the average cost of the new construction programmes in recent years, the figures being those of the complete cost of all vessels laid down in any particular year. The average cost for the years 1931–4 was less than £12 millions, but the cost of the 1936 programme, including the measures

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of acceleration referred to in the preceding paragraph, will be nearly £50 millions. It is contemplated that the cost of the 1937 programme will be substantially higher.

16. In addition to new construction, heavy expenditure must also be incurred in modernising existing vessels. This applies, not only to capital ships, but also to cruisers. The provision of improved anti-aircraft defence is required. At the same time the acquisition in sufficient quantity and proper quality of the ammunition, fuel, stores and various equipment of all types which the Navy requires has also to proceed.

17. The programme will involve a further large increase in the strength of the personnel of the Navy, as well as expenditure on the provision or adaptation of new quarters, and on important new works services needed in the Dockyards and other Naval Establishments, more particularly in connection with storage for ammunition, oil fuel and other reserves.

18. The Fleet Air Arm is being substantially increased in numbers of aircraft, and considerable measures of re-equipment are also necessary to keep pace with the evolution of more powerful types.

IV.

The Army.

19. It was stated in the White Paper of March last that the only increase in the number of fighting units in the Regular Army then proposed was the creation of four new battalions of infantry. These units are required for maintaining our overseas garrisons. Two of them are to be raised in the near future. Certain additional increases are necessary. These include two new Army Tank battalions, one of which will be raised in the near future, and certain ancillary troops necessary to enable a modern force to operate effectively in the field.

20. While recruiting has already shown some slight improvement, it has been decided to adopt certain measures designed to improve conditions in the Army and to make the Service more attractive. Details of this scheme will be announced shortly. The adoption of these measures will bring about a considerable increase in normal maintenance costs, as a result of the increased numbers which it is expected will be borne on the strength, and of the additional expense arising from the measures designed to stimulate recruiting.

21. The main increase in expenditure on the Regular Army falls, however, under the heading of equipment. Viewed from the standpoint of the variety and extent of our Imperial responsibilities, or of comparison with continental forces, our Regular Army is small in numbers. It is, therefore, all the more important that its equipment and organisation should be brought up to the highest standard in all respects. Accordingly, steps are now in active progress for the modernisation of the equipment of the field artillery, infantry and all branches of the service. The progress of mechanisation, involving the provision of a complete system of motor transport and of

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armoured vehicles of all types, is being accelerated. The requirements of modern war demand the accumulation of immense reserves of ammunition to cover the first months before productive capacity can be increased, and the necessary arrangements for this provision are being made.

22. For the time being the urgent needs of the Regular Army have had to take priority over those of the Territorial Army. But in any survey covering a period of years account must be taken of the requirements of the latter, more especially since the training of the Territorial Army is at present severely handicapped by the lack of modern equipment. Plans are being drawn up to remedy this situation, and steps will be taken, as soon as the supply position permits, to enable the Territorial Army to train with the same types of weapons as those with which the Regular Army is equipped.

23. During the next few years it will be necessary to make provision in Army Estimates for heavy capital expenditure on works services in order to bring barrack accommodation up to modern standards and to provide the additional storage, workshops and buildings required for modern mechanised forces.

V.

The Air Force.

24. It was stated in the White Paper of March, 1936, that the prime function of the Royal Air Force is to provide an effective deterrent to any attack upon the vital interests of this country whether at home or overseas. It may be added also that in recent years the range and performance of modern aircraft have undergone rapid development and this country has become increasingly vulnerable to air attack. The strength of the Royal Air Force has become a matter of paramount importance, and no effort has been or is being spared to bring that Force up to the strength and standard of efficiency which His Majesty's Government deem requisite for our safety. This aim entails both substantial expenditure of a capital nature, and a large increase in recurrent costs. The programme for the Royal Air Force includes the acquisition and preparation of large numbers of new aerodromes, with the building of over 75 operational, training and other stations at home and abroad. The increase in the number of squadrons entails corresponding additions to the capacity of training and other ancillary establishments generally. The personnel of the Force has already risen from 31,000 in 1934 to over 50,000 in 1936, while a further large increase is contemplated in the coming financial year.

25. As regards equipment, the main requirement of the Royal Air Force consists, of course, of the very large numbers of air-frames and aero-engines necessary to equip the new squadrons and to provide sufficient reserves to ensure that the first-line strength can be adequately maintained on active service. Further, the development of new types, which is constantly proceeding, tends to result

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in the production of more efficient, but at the same time more costly machines.

26. Other items required by the programme of expansion include the provision of specialised equipment for aircraft, stores of bombs and other ammunition, adequate reserves of fuel, additional motor transport and the storage accommodation required for reserves of all kinds.

27. It must be appreciated that the scale of expenditure on the maintenance of the Royal Air Force which obtained before the present measures of expansion were put in hand will be very largely increased to provide for the future upkeep of the Force, even when the initial expenditure on the expansion programme has been met.

VI.

Reserve Factory Capacity.

28. The measures briefly referred to in the preceding paragraphs would not, however, suffice to meet the needs of the Defence Services, unless adequate preparations were made in peace time to ensure a sufficient supply of munitions and stores in time of emergency. For this reason, steps are being taken to build up what has come to be known as a "war potential." Thus in the aircraft industry, over and above the expansion of the capacity of the existing aircraft firms, steps have been taken to build "shadow" aircraft factories. These factories will be available in any emergency to provide aircraft in large quantities, and since they will be used in the first instance to supply aircraft required for the expansion scheme, the engineering firms who are co-operating in the scheme will thereby gain invaluable experience in the technique of aircraft manufacture.

29. The same principle is being adopted in regard to the supply of other types of munitions. Extensions of plant are being laid down by firms not normally engaged on the production of munitions, and the orders placed with these firms fulfil the double purpose of making good existing deficiencies, and of providing means for the rapid expansion of output in war time. These extensions of capacity are being made under arrangements which ensure their retention over a period of years, after the existing orders have been completed, in a form capable of rapid turnover to munitions in the event of emergency.

30. In making plans for the industrial resources required by the Forces it is necessary to have regard to the risks of air attack. Steps have been requisite in various instances to ensure that sources of essential supplies are sufficiently dispersed, and in some cases a degree of duplication of essential services is necessary even at the cost of some increase in expenditure.

31. A number of new Government factories for the manufacture of explosives, and for the filling of shells and bombs, are being built or planned. These factories represent in part the removal to safer

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localities of existing establishments, and in part the additions required to bring capacity up to the increased needs of the three Services.

32. Steps are also being taken to see that national establishments and industries, vital to the Defence Services, are not paralysed by the shortage of certain essential raw materials. The accumulation of essential reserves for these and other purposes is in hand, and will of course involve very substantial expenditure. The provision of adequate supplies of fuel of the types required by each of the three Services and for civilian needs, as well as their protection and replenishment in the event of war, have received special consideration.

VII.

Home and Overseas Defence.

33. The needs of Home Defence now require a number of specific measures, each of much importance. Foremost among these is the provision of anti-aircraft defence. Two divisions of the Territorial Army have been re-formed and greatly expanded for this essential service, and further expansion is to take place during the forthcoming year. This expansion involves the provision of new Territorial Army headquarters in many districts hitherto largely unrecruited, in addition to the modernisation and in some instances entire replacement of existing drill halls. New and more efficient types of guns are being manufactured, together with large numbers of searchlights and other equipment, and reserves of ammunition are being accumulated. Balloons and equipment for balloon barrages are being manufactured. Plans are being made to ensure that the organisation for air defence will be readily adaptable to meet whatever type of air attack this country might be called upon to face.

34. Amongst arrangements for the protection of the civil population against air raids, stocks of respirators and other equipment are being accumulated to provide against the contingency of gas attack. The preparation of local schemes of air raid precautions and the organisation of the necessary personnel for air raid services are now being undertaken on an increasing scale throughout the country. His Majesty's Government have undertaken to provide instruction of the police and other personnel so as to make them capable of acting as instructors in anti-gas measures in their own areas. One anti-gas school has been in operation for almost a year, and in order to cope with increasing requirements in this respect a second school is now being established.

35. The fire risks from incendiary bombs dropped from aeroplanes present a problem which is beyond the capacity of normal peace time fire brigade organisations. Arrangements are being planned to accumulate the additional fire-fighting appliances required to meet this risk, and to train reserve personnel.

36. The defences of our overseas bases also require additions to meet the menace of attack from the air, and increased protection

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will be provided at important ports abroad in the form of anti-aircraft batteries and searchlights. In addition, the modernisation of coast defences at home and abroad will involve considerable expenditure.

VIII.

Essential Character of the Programme.

37. It will be seen that the programme which must be carried out before our defences can be restored to a level of safety covers a wide range. It includes the provision of great quantities of material for all three Services, in the form of ships, guns and ammunition, aeroplanes, tanks and equipment of all types. It also involves large additions to the personnel of the Services, and heavy expenditure on the purchase of land and the erection of buildings, barracks, workshops and arsenals.

38. To enable this programme to be carried to a successful conclusion, arrangements must be made with industry for the extension of its capacity to supply munitions for the Defence Services. The development of air power has raised entirely new problems of defence both at home and abroad, requiring not only increased quantities of the obvious defensive weapons and equipment, but also a certain amount of redistribution and dispersal of resources, all of which naturally adds to the cost.

39. From the outline here sketched in, the formidable nature of the task confronting His Majesty's Government is apparent. Since they first embarked upon it, the conditions which governed its extent and pace cannot be said to have become more favourable, and at present at any rate there would in the view of His Majesty's Government be no justification for any reduction or slowing down of the programme. It is their firm belief that in the form here presented it is a contribution indispensable to peace, and one which it is the duty of the people of this country to make.

IX.

The Cost.

40. As stated in the Memorandum on the proposed Resolution dated the 11th February, 1937 (Cmd. 5368), it is not practicable to state the total cost of a programme which it is intended to spread over a period of years, and which will necessarily be subject to substantial modifications as conditions change. Nevertheless, some indication can now be given of the order of magnitude of the expenditure which must be contemplated.

41. Taking into account the rapid growth of defence expenditure in the last two years, and the fact that an appreciable time necessarily elapses between the date when increases in capacity are laid down and the date when full production is achieved, it is probable that

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the level of expenditure over the next two or three years at least will be very much heavier than in the current year. It is not at present possible to determine what will be the peak year of defence expenditure; that must depend on circumstances which cannot at present be foreseen, and upon decisions to be taken in future years. Taking the programme as it stands to-day, however, it would be imprudent to contemplate a total expenditure on defence during the next five years of much less than £1,500 millions.

42. Deeply as they deplore the necessity for this vast expenditure on armaments and other defensive measures, His Majesty's Government are convinced that it must be undertaken. It has been forced upon them, partly by the circumstances of the time, and partly by the long interval during which comparatively small demands have been made upon the national finances for the purposes of the Defence Forces. It would be neither practicable nor just that the whole burden of making good these deficiencies in the short period of five years should be thrown upon the taxpayer during that time, and His Majesty's Government are satisfied that, in proposing to spread a part of it over a longer period, they are pursuing a course which is fully justified both in equity and in the general interests of the nation.

February 16, 1937.

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STATEMENT TO ACCOMPANY NAVY ESTIMATES, 1937.

THE figure which in a normal year would form the net total of the Navy Estimates, is, for 1937, £105,065,000, which exceeds the total Navy Estimates for 1936, including Supplementary Estimates, by £23,776,000. Of this total £27,000,000 will be provided by issues from the Consolidated Fund, subject to statutory authority being obtained in accordance with the terms of the Defence Loans Bill now before Parliament. The figure, therefore, shown as the net total of Navy Estimates, 1937, is £78,065,000.

The policy on which this provision is based is that laid down in the White Papers presented to Parliament on 3rd March, 1936, Cmd. 5107, and 16th February, 1937, Cmd. 5374, and the increased programme of new construction and acceleration of ship building forecast therein are fully reflected in the enhanced supply for which I am asking.

The largest increase over last year's provision is to be found in New Construction, and amounts to £14,033,215. This increase is due not only to the commencement of a building programme appreciably larger than that provided for in 1936, but also to a full annual provision for the 1936 programme, which was itself more than double the programme of immediately preceding years. The other large increase in the 1937 Navy Estimates is £9,081,985, for maintenance of the Fleet, including modernisation of capital ships and large repairs, increase in personnel and the making good of deficiencies in stores and material reserves. There is, in addition, an increase of £516,500 for additional aircraft (other than for new construction) and maintenance of the Fleet Air Arm, and an automatic increase in non-effective services of £144,300.

The provision for Vote A includes an addition of nearly 11,000 to the personnel of the Fleet, necessitated by the increased programmes of New Construction for 1936 and 1937, including the expansion of the Fleet Air Arm.

The New Construction Programme for 1937 is as follows :—

Three battleships (" King George V " type),
Two aircraft carriers,
Five cruisers (about 8,000 tons),
Two cruisers (about 5,300 tons),
Sixteen destroyers (repeat " J " type),
Seven submarines (" Patrol " type),
Three escort vessels (previously known as " Convoy Sloops"), one being for surveying duties,
Four minesweepers (previously known as " Sloop Minesweepers "),

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Three patrol vessels (previously known as " Coastal Sloops "), and a number of miscellaneous vessels, namely :—
One destroyer depot ship,
One submarine depot ship,
One small surveying ship,
Two large river gunboats,
Two special service vessels,
Ten motor torpedo boats,
Sixteen boom defence vessels,
Two tugs.

In the principal categories of ships, therefore, this programme is larger than that of 1936 by one capital ship and smaller by one destroyer and one submarine.

As the Washington and London (1930) Naval Treaties expired on 31st December, 1936, there is no longer any quantitative limitation on naval construction in any category of warships, but pending ratification of the London Naval Treaty 1936, the qualitative limitations contained therein are being observed in the construction of ships now laid down or projected.

As in previous years, allowance has been made for anticipated underspending in contract work.

SAMUEL HOARE.

ADMIRALTY,
26th February, 1937.

NOTES ON MATTERS OF GENERAL INTEREST.

FLEET MOVEMENTS IN CONNECTION WITH THE CORONATION OF HIS MAJESTY KING GEORGE VI.

The Coronation Naval Review will take place at Spithead on 20th May. The Home Fleet, units from the Mediterranean and Reserve Fleets, H.M.S. Leander representing the New Zealand Division of the Royal Navy, H.M.C.S. Saguenay, H.M.C.S. Skeena and H.M.I.S. Indus will take part.

The Merchant and Fishing Fleets will be represented. Representative foreign warships will also be present.

It is expected that the Home Fleet, in addition to carrying out the normal seasonal cruises and exercises, will visit the Thames during Coronation Week.

NAVAL TREATIES.

The Washington Naval Treaty and the London Naval Treaty (1930) expired on 31st December, 1936. Those clauses of the London Naval Treaty (1930) which prohibit unrestricted submarine warfare have been embodied in a " procès-verbal," which has been acceded to by several, including the principal, naval Powers. The remaining naval Powers have been asked to accede to these rules, and favourable replies from them are expected in the near future.

The London Naval Treaty (1936), embodying important principles of qualitative limitation, was signed by members of the British Commonwealth of Nations, France and the U.S.A. on 25th March, 1936. The Treaty has been ratified by the U.S.A., but ratification by the United Kingdom and France has been delayed pending the negotiation of similar bilateral agreements by this country with Germany and Soviet Russia, and the clarification of the position as regards the 14-inch gun for capital ships. It is hoped that a satisfactory conclusion to these negotiations will soon be achieved.

Negotiations for similar agreements with Denmark, Finland, Norway, Poland, Sweden and Turkey, are also making satisfactory progress.

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DISTRIBUTION OF THE FLEET.

The distribution of ships at the beginning of the financial year 1936 was affected by the temporary detachment of certain vessels to the Mediterranean and the Red Sea, and some vessels additional to those of the normal Fleets were in commission. Ships were in course of returning to their normal stations in July last, but some modifications of these movements were necessitated by the outbreak of civil war in Spain. Except for the arrangements to maintain ships in Spanish Waters and off the coast of Palestine, normal distribution may be said to have been resumed by the autumn of 1936.

Battleships and Battle Cruisers.

The Valiant, having returned to the United Kingdom, will undergo large repairs, and the Malaya will proceed to the Mediterranean after repair of collision damage. On completion of her large repairs the Warspite will take the place of the Queen Elizabeth, which will then commence her large repairs.

The Battle Cruiser Squadron (the Hood and the Repulse) joined the Mediterranean Fleet in 1936 as previously arranged and announced.

The Renown is undergoing large repairs.

Aircraft Carriers.

The Furious continues to be employed on training duties, working with the Home Fleet.

The Eagle is due to relieve the smaller carrier Hermes in China in the spring of this year, the latter returning home.

Cruisers.

Home Station.

The Southampton, Newcastle, Sheffield, Glasgow and Birmingham of the new "Southampton" Class are due to join the 2nd Cruiser Squadron in 1937.

The Aurora is due to relieve the Cairo as the ship of the Commodore Commanding Home Fleet Destroyer Flotillas in August.

Mediterranean Station.

The Penelope joined the 3rd Cruiser Squadron in January, 1937, relieving the Durban.

The Curlew and Coventry, which have been fitted as anti-aircraft cruisers, have been brought home and placed in Reserve.

America and West Indies Station.

The Orion, after relief in the 2nd Cruiser Squadron, will relieve the Dragon in the course of this year, the latter ship going into Reserve.

Africa Station.

The Amphion left England in July, 1936, and after a long stay at Teneriffe in connection with the Spanish civil war, arrived on the station in October and took the flag of the Commander-in-Chief.

The Carlisle will be relieved by the Neptune from the 2nd Crusier Squadron in 1937.

China Station.

The Cumberland, having completed large repairs and returned to the China Station, has become the flagship of the Commander-in-Chief.

The Cornwall and Kent have returned to England for large repairs. The Cornwall will complete repairs towards the end of 1937 and return to the China Station.

The Berwick will return to England for large repairs in July, 1937.

The Danae left England in October, 1936, and the Suffolk in February, 1937, for the China Station.

New Zealand Division of the Royal Navy.

The Diomede has been relieved by the Achilles.

The Dunedin will be relieved by the Leander in the spring of 1937.

Leaders and Destroyers.

The "Beagle" Class have been transferred from the Mediterranean to the Home Fleet.

The "Greyhound" and "Hero" Classes have joined the Mediterranean Fleet.

These allocations have completed the relief, in the Main Fleets, of the last remaining destroyers of War design.

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SUBMARINES.

The submarine minelayer Narwhal of the 1933 programme has completed, and has joined the 2nd Submarine Flotilla.

The Seawolf of the 1933 programme and Spearfish of the 1934 programme have both been completed, and joined the 5th Submarine Flotilla.

The minelayer Grampus of the 1933 programme is completing her trials, and will shortly be handed over.

The Rorqual, a minelayer of the 1934 programme, has already been delivered.

The Sunfish of the 1934 programme will be completing shortly.

ESCORT VESSELS.

The Aberdeen (1935 programme) has replaced the Bryony in the Mediterranean.

The Fleetwood (1935 programme) has joined the Home Fleet for special trials.

The Hastings, on completion of repairs at Malta, will replace the Harebell in the early summer as the ship of the Captain, Fishery Protection and Minesweeping.

PATROL VESSELS.

The Kingfisher, first of the patrol vessels of a new type, has joined the Fishery Protection Flotilla, and is employed in Scottish waters.

The Mallard and Puffin have relieved two old "P" boats in the 1st Anti-Submarine Flotilla.

The Kittiwake (1935 programme) will complete in April, 1937, and will relieve Patrol Craft 74 in the 1st Anti-Submarine Flotilla.

The Sheldrake (1935 programme) will complete in June, 1937, and will relieve the Dart in the Fishery Protection Flotilla.

MINESWEEPERS.

The Niger and Salamander of the 1934 programme have replaced older vessels in the 1st Minesweeping Flotilla.

The Hazard, Hebe and Sharpshooter of the 1935 programme will complete towards the end of 1937, and will probably also join the 1st Minesweeping Flotilla.

The nine minesweepers recently in reserve at Malta have been transferred to Singapore. It is intended to replace these vessels at Malta in due course.

SURVEYING SHIPS.

The new surveying ship Stork (escort vessel) was completed in September, 1936, and proceeded to the East Indies.

The new surveying ship Gleaner (minesweeper) will, on completion in the autumn of 1937, replace the Beaufort on surveying duties in Home Waters.

YACHTS.

The Enchantress, in addition to her duties as Admiralty Yacht, has been employed as a unit of the 1st Anti-Submarine Flotilla.

CO-OPERATION WITH THE DOMINIONS, ETC.

GENERAL.

The Imperial Conference, to be held in May, will provide an opportunity for the discussion with Dominion authorities of important questions of naval defence.

COMMONWEALTH OF AUSTRALIA.

The following old destroyers have been prepared for disposal :—Success, Tasmania, Tattoo, Swordsman, Stalwart.

H.M.A.S. Australia remained attached to the 1st Cruiser Squadron, Mediterranean, until July, 1936. H.M.A.S. Sydney was transferred from the 2nd Cruiser Squadron at Gibraltar to 1st Cruiser Squadron, Mediterranean Fleet, in March and remained with the latter until July. In April both ships were present at Kilia Liman, Gallipoli, at a Memorial Service for those who fell in the Gallipoli Campaign of the Great War.

In July both vessels left the Mediterranean for Australian waters. The co-operation of the Australian Government in consenting to the stay of these ships in the Mediterranean has been greatly appreciated.

DOMINION OF CANADA.

The destroyers Crescent and Cygnet have been purchased by Canada and have been renamed H.M.C.S. Fraser and H.M.C.S. St. Laurent respectively. They replace

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the Champlain and Vancouver, which were paid off in November, 1936, for disposal. It is intended that the Fraser and the St. Laurent shall take part in exercises with the America and West Indies Squadron during March.

Dominion of New Zealand.

With the concurrence of the Government of New Zealand, the Diomede remained under the orders of the Commander-in-Chief, East Indies Station, until February, 1936. She then proceeded to the United Kingdom to turn over her crew to the Achilles, which ship was due to replace her in the New Zealand Division.

The Achilles worked up at Gibraltar and proceeded to New Zealand waters in July. The co-operation of the New Zealand Government in connection with the Diomede and the Achilles has been greatly appreciated.

The relief of the Dunedin in the New Zealand Division by the Leander will take place in the spring of 1937.

FLEET ACTIVITIES ABROAD.

Mediterranean.

The disturbances in Palestine necessitated the presence of certain of H.M. Ships until the arrival of Army reinforcements in late September, when a reduction in the number of ships became possible. During their stay, the ships provided guards for Dockyards and Customs ports, landing parties to support police and military forces, and personnel for manning armoured trains, and pom-pom and searchlight lorries. Patrols were carried out off the coast by the smaller ships to prevent smuggling. The last ship was withdrawn late in January, 1937.

Since the beginning of civil war in Spain a considerable number of ships has been continuously engaged in protecting British interests and in evacuating refugees from Spanish ports, in the course of which assistance has been given to the nationals of a large number of countries. It has proved necessary to provide reliefs for these ships and this requirement has been the chief factor governing the programme of the Mediterranean Fleet.

Up to 31st January, 1937, 16,932 refugees of fifty-five different nationalities had been evacuated from Spanish ports.

The Commander-in-Chief, Mediterranean, and units of that Fleet paid a visit to Athens in October, at the invitation of the Government of Greece.

The Turkish Battle Cruiser Yavouz with destroyers and submarines paid a visit to Malta in November.

East Indies.

In May the Enterprise conveyed the Emperor of Abyssinia and his suite from Djibouti to Haifa.

Persian Gulf.

The Sheikh of Bahrein was conveyed to and from Basrah by H.M. ships during the summer.

Our Treaty obligations with the Arab Sheikhs have been maintained by the escort vessels stationed in these waters. Anti-slavery patrols have been carried out.

In August the Bideford and Fowey co-operated with the Royal Air Force in endeavouring to locate the Imperial Airways aircraft Horsa which had made a forced landing on the Qatar Peninsula.

Red Sea.

The usual anti-slavery patrols have been carried out.

America and West Indies.

The America and West Indies Squadron was represented at the Golden Jubilee celebrations of the City of Vancouver, held in September, 1936.

In January, 1937, the Ajax proceeded to the South Shetland Islands to assist in the search for a party from the R.R.S. Discovery, who were missing from Esther Bay, King George Island.

China.

H.M. ships have, as usual, been stationed throughout the year at coast and river ports to safeguard British interests, and ships have been sent to localities which have been threatened by trouble.

The Chinese art treasures, which had been lent for the exhibition in London, were conveyed back to China in a merchant vessel, which was escorted for a large part of the journey by H.M. ships.

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The anti-piracy patrol off Bias Bay has been maintained, and continues to be a deterrent to piracy in this area.

The Danae proceeded to Australia on her way out to join the station, and visited Adelaide to take part in the South Australian Centenary celebrations.

Africa.

In April, 1936, at the request of the Village Management Board, naval assistance was sent to Fish Hoek near Simonstown, where a serious bush fire was threatening extensive damage. The naval party were largely instrumental in getting the fire under control.

In October the Carlisle and Amphion sent a contingent to the Johannesburg Empire Exhibition, and a display was given.

HYDROGRAPHY.

During 1936 H.M. Surveying Ships have been employed in making new surveys or re-surveys as necessary, the number of ships so engaged being two at home and four abroad. Of the latter, one has been employed in the Far East, one in the West Indies and one at Aden. The new Surveying Ship, H.M.S. Stork, replacing H.M.S. Ormonde, commissioned in September and proceeded to the East Indies to continue the survey of the coast of Siam which was begun in 1934.

H.M.S. Endeavour completed a long refit in February and sailed for New Zealand to undertake a detailed survey of the waters of that Dominion.

Owing to shortage of personnel two Surveying Ships were not commissioned for service in Home Waters, but a detached party, housed on shore, carried out surveying duties on the west coast of Scotland.

The tidal stream survey of the British Isles has been continued, and satisfactory progress made.

METEOROLOGY.

Progress continued during 1936, in collaboration with the Air Ministry, in the development of Fleet meteorology, and a comprehensive organisation for Fleet requirements is being brought into force. The improvement of meteorological instruments, and the collection of meteorological data, continue.

NAVIGATION.

Continual attention has been directed towards providing H.M. ships with modern aids to navigation, particularly in the fitting of echo-sounding apparatus.

FISHERY PROTECTION.

The work of the Fishery Protection and Minesweeping Flotillas in protecting and assisting the Fishing Fleets, and in training officers and men of the Reserves in minesweeping, has been continued.

During the past year, the Captain Commanding the Fishery Protection Flotilla visited ports in Belgium and Germany, and vessels under his command visited ports in Belgium, Faroe Islands, France, Germany, Holland and Iceland.

CO-OPERATION BETWEEN THE SERVICES.

Owing to many calls on the Navy due to unforeseen international developments, the number of exercises carried out in conjunction with the Military and Air Forces has been less than in former years, but combined operations, which have included the landing of troops, have been carried out at home and abroad. Exercises have also taken place to test the defences of various ports both at home and abroad.

The usual exercises between the Staff Colleges of the three Services have taken place.

When units have been available, opportunity has been taken for certain squadrons of the R.A.F. to practise locating and attacking ships at sea.

FLEET TRAINING.

The international situation has somewhat affected the normal dispositions and movements of the Fleet; it has consequently not been possible to carry out any large scale exercise during 1936, such as took place in the Atlantic in 1934 and 1935, when the combined Home and Mediterranean Fleets took part in extensive operations. It

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is intended, however, that a combined Fleet exercise shall be held during March of this year, when the Home and Mediterranean Fleets meet during the Spring Cruise.

Apart from tactical exercises, tactical training generally has been continued and many valuable lessons have been learnt.

NAVAL AIR WORK.

Four aircraft carriers have been in commission: the Glorious with the Mediterranean Fleet; the Courageous and Furious with the Home Fleet; the Hermes in Far Eastern waters.

The Eagle in now in commission and is about to relieve the Hermes.

To meet the expansion of the Fleet Air Arm Hermes, on her return from China, will be refitted and attached to the Home Fleet. The Argus during the coming year will be reconditioned and fitted to carry the aircraft required for fleet gunnery exercises. Constructional work on the Ark Royal continues and arrangements are in hand for the construction of two new carriers, the Illustrious and Victorious. Additional ships have been fitted with catapults.

PERSONNEL.

The additional requirements of officers due to the rearmament programme are being met by increased entries in all branches. In addition the preliminary training of junior executive naval officers and of Royal Marines is being temporarily curtailed, thus enabling vacancies to be filled earlier than would normally be the case. In order to meet the shortage of officers of the rank of lieutenant, a scheme has been introduced to enter officers from the Merchant Navy by the transfer of Royal Naval Reserve officers to the Supplementary List of the Royal Navy. These officers will be eligible for promotion to Commander in exceptional cases only and will normally retire on pension at the age of 45.

Arrangements have recently been made for the formation of the Royal Naval Volunteer Supplementary Reserve which consists of a list of gentlemen with sea and yachting experience who volunteer to accept commissions in the Royal Naval Volunteer Reserve in war time, if and when called upon. The response has been good.

It has been decided to reorganise the Royal Naval College, Dartmouth, by the substitution of a house system for the present term system.

Recruiting for the Royal Navy and Royal Marines has been satisfactory except in the direct entry of skilled men for the artificer branches of the Navy. The entry of seamen for continuous and special service engagements has been greatly increased and extra accommodation has had to be provided. The White Star Liner S.S. Majestic has been bought and converted into a stationary training ship for 1,500 boys and 500 artificer apprentices. She will be commissioned as H.M.S. Caledonia in April and stationed at Rosyth to accommodate the increased numbers of continuous service entrants pending the erection of the establishment on shore for which provision is made under Vote 10. The sub-depot at Sheerness has been converted into a training establishment for special service boys and will be known as H.M.S. Wildfire. The employment as a boys' training ship of H.M.S. Royal Sovereign has proved of great value, and owing to a further increase in the number of boys leaving the training establishments in the near future a second ship will be used as a boys' training ship beginning in April this year.

In order to maintain an adequate proportion of experienced men during the period of expansion, provision has been made for men to re-engage, on specially favourable terms, for further periods of service after completing time for pension.

The rate of marriage allowance for men serving on the scale of pay which was introduced in 1925 has been increased by 3*s*. a week and the qualifying age has been reduced to 21 for men of the Royal Naval Reserve, Royal Naval Volunteer Reserve, Royal Naval Auxiliary Sick Berth Reserve and Royal Naval Wireless Auxiliary Reserve during their periods of sea training.

A review of service conditions was begun in all commands in September and October, 1936, and the representations made from the Fleet are now under review by the Admiralty. Over 4,000 requests have been received, ranging from general conditions of service to matters of detail, and special steps are being taken to hasten their consideration. It is clear, however, that some time must elapse before decisions can be given on all these requests and it is therefore intended to issue decisions in batches as they are arrived at. The first batch of decisions has recently been published.

The family welfare sections instituted in 1935 have continued to operate with marked benefit to the dependents of naval ratings. The sections at the Home Ports

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are fully occupied and a section is now being established at Malta, in view of the length of time which most naval ratings have to spend on the Mediterranean Station.

The bounty for members of the Royal Naval Volunteer Reserve has been increased and provision has been made for payment of travelling expenses incurred by members of the Reserve in attending drills.

MATERIAL. NEW CONSTRUCTION.

Battleships.

1936 *Programme.*

The King George V and Prince of Wales, the first two battleships of the "King George V" Class, with a standard displacement of 35,000 tons, were ordered in July, 1936, from Messrs. Vickers-Armstrongs, Ltd., and Messrs. Cammell Laird & Co., Ltd., respectively. Both vessels were laid down on 1st January, 1937.

Aircraft Carriers.

1934 *Programme.*

The Ark Royal, under construction by Messrs. Cammell Laird & Co., Ltd., will be launched in April, 1937.

1936 *Programme.*

The Illustrious and the Victorious, two aircraft carriers of the 1936 Programme with a standard displacement of 23,000 tons, were ordered on 13th January, 1937, from Messrs. Vickers-Armstrongs, Ltd., the former to be built at Barrow and the latter at Walker-on-Tyne.

Cruisers.

1931 *Programme.*

The Amphion, of the modified "Leander" Class, was completed at Portsmouth in July, 1936.

1933 *Programme.*

The Penelope, of the "Arethusa" Class, was completed by Messrs. Harland & Wolff, Ltd., Belfast, in November, 1936.

The Newcastle and the Southampton, of the "Southampton" Class, under construction by Messrs. Vickers-Armstrongs, Ltd., and Messrs. John Brown & Co., Ltd., respectively, have completed their trials satisfactorily and are due to complete in March, 1937.

1934 *Programme.*

The Aurora, of the "Arethusa" Class, building at Portsmouth, was launched on 20th August, 1936, and is expected to complete in the summer of 1937.

The Glasgow, of the "Southampton" Class, under construction by Messrs. Scott's Shipbuilding and Engineering Co., Ltd., was launched on 20th June, 1936, and is expected to complete during the summer of 1937. The sister ship Sheffield, under construction by Messrs. Vickers-Armstrongs, Ltd., Walker-on-Tyne, was launched on 23rd July, 1936, and is expected to complete about August, 1937. The Birmingham, also of the "Southampton" Class, which is building at Devonport, was launched on 1st September, 1936, and is due to complete in November, 1937.

1935 *Programme.*

The Liverpool, under construction by Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., is due to be launched in March, 1937, and the Manchester, under construction by Messrs. Hawthorn Leslie & Co., Ltd., in April, 1937. The keel of the Gloucester was laid at Devonport on 22nd September, 1936. These vessels are all of the "Southampton" Class.

1936 *Programme.*

Orders were placed on 15th August, 1936, for the construction of two improved "Southampton" Class cruisers to be built by contract, the Belfast by Messrs. Harland & Wolff, Ltd., Belfast, and the Edinburgh by Messrs. Swan Hunter & Wigham Rochardson, Ltd., Wallsend-on-Tyne. The Belfast was laid down on 10th December, 1936, and the Edinburgh on 30th December, 1936.

Contracts will shortly be placed for the construction of the Dido, Naiad and Phoebe, three Cruisers of the "Dido" Class (about 5,000 tons displacement).

The Sirius and Euryalus, also of the "Dido" Class, will be built at Portsmouth and Chatham Dockyards, respectively.

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Leaders and Destroyers.

1933 *Programme.*

The flotilla leader Grenville was completed in July, 1936, and the eight destroyers of the "Greyhound" Class during the period January to March, 1936.

1934 *Programme.*

The flotilla leader Hardy was completed in December, 1936, and the eight destroyers of the "Hero" Class during the period September, 1936, to January, 1937.

1935 *Programme.*

The construction of the flotilla leader Inglefield and the eight destroyers of the "Intrepid" Class is proceeding satisfactorily and they will, it is anticipated, be completed by the summer of 1937.

Orders for the building of seven destroyers of the "Tribal" Class were placed on 10th March, 1936, as follows :—

Afridi, Cossack — Messrs. Vickers-Armstrongs, Ltd., Walker-on-Tyne.
Gurkha, Maori — Messrs. The Fairfield Shipbuilding and Engineering Co., Ltd., Govan.
Mohawk, Nubian — Messrs. John I. Thornycroft & Co., Ltd., Southampton.
Zulu .. Messrs. Alex. Stephen & Sons, Ltd., Govan.

Construction is proceeding satisfactorily and the vessels should be completed between January and March, 1938.

1936 *Programme.*

Orders for the building of nine further destroyers of the "Tribal" Class were placed on 19th June, 1936, as follows :—

Somali, Tartar — Messrs. Swan Hunter & Wigham Richardson, Ltd., Wallsend-on-Tyne.
Eskimo, Mashona — Messrs. Parsons Marine Steam Turbine Co., Ltd., Wallsend-on-Tyne. (Hulls by Messrs. Vickers-Armstrongs, Ltd.)
Matabele, Punjabi — Messrs. Scott's Shipbuilding and Engineering Co., Ltd., Greenock.
Ashanti, Bedouin — Messrs. Wm. Denny & Bros., Ltd., Dumbarton.
Sikh .. Messrs. Alex. Stephen & Sons, Ltd., Govan.

In addition orders will shortly be placed for the construction by contract of the following eight destroyers ("Javelin" Class), of which the Jervis will be fitted as a leader :—

Jervis.
Jackal.
Jaguar.
Jamaica.
Janus.
Javelin.
Jersey.
Jupiter.

It has been decided that this flotilla shall consist of eight vessels only and construction of the ninth vessel originally allowed for in the programme will not be proceeded with.

Submarines.

1933 *Programme.*

The Seawolf of the "Swordfish" Class was completed at the works of Messrs. Scott's Shipbuilding and Engineering Co., Ltd., Greenock, in March, 1936.

The minelayer submarine Narwhal, of the "Porpoise" Class, was completed at the works of Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness, in February, 1936. The sister ship Grampus is expected to complete at Chatham Dockyard in March, 1937.

1934 *Programme.*

The Spearfish of the "Swordfish" Class was completed by Messrs. Cammell Laird & Co., Ltd., in December, 1936. The sister vessel, the Sunfish, is expected to complete at Chatham Dockyard in June, 1937.

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The minelayer submarine Rorqual of the "Porpoise" Class, constructed by Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness, was delivered on 10th February, 1937.

1935 *Programme.*

The Sterlet, the last vessel of the "Swordfish" Class, under construction at Chatham Dockyard, is due to complete early in 1938.

Orders were placed on 5th March, 1936, for the construction of the minelayer submarine Cachalot of the "Porpoise" Class at Messrs. Scott's Shipbuilding and Engineering Co., Ltd., Greenock. She is due to complete early in 1938.

The Triton, the name-ship of a new class of patrol submarines ordered from Messrs. Vickers-Armstrongs, Ltd., on 23rd March, 1936, was laid down at Barrow on 28th August, 1936, and is due to complete in March, 1938.

1936 *Programme.*

The minelayer submarine, Seal, of the "Porpoise" Class, which commenced building at Chatham Dockyard in July, 1936, was laid down on 9th December, 1936.

The Thetis, of the "Triton" Class, ordered on 10th August, 1936, from Messrs. Cammell Laird & Co., Ltd., Birkenhead, was laid down on 21st December, 1936.

The Triumph, Trident and Tribune, also of the "Triton" Class, were ordered on 6th November, 1936, from Messrs. Vickers-Armstrongs, Ltd., Barrow, Messrs. Cammell Laird & Co., Ltd., Birkenhead, and Messrs. Scott's Shipbuilding and Engineering Co., Ltd., Greenock, respectively.

Orders were placed on 5th November, 1936, for three small submarines, Unity, Undine and Ursula ("Unity" Class), to be built by Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness.

SLOOPS.

Patrol sloops, convoy sloops, sloop minesweepers and coastal sloops, hitherto grouped under the general heading "sloops," are now referred to under the following new classification :—

Patrol and Convoy Sloops	..	as Escort Vessels.
Sloop Minesweepers ..	..	as Minesweepers.
Coastal Sloops	..	as Patrol Vessels.

The escort vessels of the 1934 programme, Aberdeen and Fleetwood, of the "Grimsby" Class, were completed at Devonport in September and November, 1936, respectively.

The escort vessel Bittern, of the 1935 programme, was ordered from Messrs. J. S. White & Co., Ltd., Cowes, on 26th May, 1936, and is due to complete in November, 1937. The Egret, a similar vessel of the 1936 programme, to be built by contract, will be ordered shortly.

The minesweepers of the 1934 programme, the Niger and Salamander, of the "Halcyon" Class, were completed in June and July, 1936, respectively. The Hebe and Sharpshooter, similar vessels of the 1935 programme, are due to complete at Devonport in October and December, 1937, and the Hazard, building by Messrs. Wm. Gray & Co., Ltd., West Hartlepool, in August, 1937.

The Leda and Seagull, minesweepers of the 1936 programme, commenced building at Devonport in July, 1936, and a contract was placed on 16th July, 1936, with Messrs. W. Hamilton & Co., Ltd., Port Glasgow, for the construction of the Gossamer, a third minesweeper of that programme.

The "Kingfisher" Class patrol vessels Mallard and Puffin, of the 1934 programme, were completed by Messrs. A. Stephen & Sons, Ltd., Govan, in July and August, 1936, respectively.

The Kittiwake and Sheldrake, similar vessels of the 1935 programme, are under construction by Messrs. J. I. Thornycroft & Co., Ltd., Southampton, and are expected to complete in April and June, 1937, respectively. The Widgeon, another patrol vessel of the 1936 programme, was ordered from Messrs. Yarrow & Co., Ltd., Scotstoun, on 13th January, 1937.

The Stork, of the 1934 programme, an escort vessel, fitted for surveying duties, was completed by Messrs. Wm. Denny Bros., Ltd., in September, 1936. The Gleaner, a minesweeper for surveying duties, of the 1935 programme, under construction by Messrs. Wm. Gray & Co., Ltd., West Hartlepool, is expected to complete in September, 1937.

The Jason, a minesweeper of the 1936 programme, to be fitted for surveying duties, was ordered on 4th September, 1936, from the Ailsa Shipbuilding Co., Ltd., of Troon, for completion early in 1938. A contract for the Heron, an escort vessel of the same programme, also to be fitted for surveying duties, will be placed shortly.

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Depot Ships for Submarines.

An order for the construction of the Maidstone, of the 1935 programme, was placed with Messrs. John Brown & Co., Ltd., Clydebank, on 30th April, 1936, and the keel of the vessel was laid on 17th August, 1936.

Other Vessels.

The Protector, a netlayer of the 1934 programme, was completed by Messrs. Yarrow & Co., Ltd., Scotstoun, in December, 1936.

The Franklin, a surveying vessel of the 1936 programme, was ordered on 4th September, 1936, from the Ailsa Shipbuilding Co., Ltd., Troon, for completion early in 1938.

An order for the river gunboat Scorpion, of the 1936 programme, was placed with Messrs. J. S. White & Co., Ltd., Cowes, on 6th November, 1936.

The order for the Research, magnetic survey vessel of the 1935 programme, was placed with Messrs. Philip & Son, Ltd., Dartmouth, on 10th September, 1936.

The Dunnet, boom defence vessel of the 1934 programme, was launched in August, 1936, at the works of Messrs. Lytham Shipbuilding Co., Ltd., and is expected to complete in April, 1937.

The two boom defence vessels of the 1935 programme (Ebgate and Bargate), originally intended to be built solely for use as gate vessels, will now be constructed to a new design, embodying features which will enable them to be used for more general boom defence duties. The names Barricade and Barrier are being substituted for the Gate names originally selected, and contracts for these two vessels and the Barbarian, Barbette, Barbican, Barrage and Barranca, five ships of the same type, of the 1936 programme, have just been placed.

The Linnet of the 1936 programme, tender to Vernon, was ordered from the Ardrossan Dockyard, Ltd., on 22nd December, 1936, and the Lassoo of the same programme, tender to the Anti-Submarine School, from Messrs. J. I. Thornycroft & Co., Ltd., Southampton, on 12th January, 1937.

The Plover, mining school tender of the 1935 programme, ordered on 21st July, 1936, from Messrs. Wm. Denny & Bros., Ltd., Dumbarton, was laid down on 7th October, 1936, and is expected to complete in the summer of 1937.

The Dwarf, submarine school tender, of the 1934 programme, built by Messrs. Philip & Son, Ltd., Dartmouth, is expected to be delivered by the end of the present financial year.

The six motor torpedo boats of the 1935 programme have been completed by the British Power Boat Co. of Southampton, and a further six (1936 programme) are being built by the same firm. As an addition to the 1936 programme a motor torpedo boat of special design was ordered from Messrs. J. S. White & Co., Ltd., Cowes, on 7th December, 1936.

As part of the 1936 programme the trawler Aston Villa has been purchased and renamed Vulcan and is being converted for service as seagoing tender for the motor torpedo boats.

The trawler Mastiff of the 1936 programme was ordered from Messrs. Henry Robb, Ltd., Leith, on the 27th January, 1937.

The tugs Brigand and Buccaneer of the 1936 programme were ordered on 17th October, 1936, from Messrs. Fleming & Ferguson, Ltd., Paisley, for completion in October, 1937. It was decided not to proceed with the construction of the third tug provided for in this programme.

Two motor minesweepers of the 1936 programme were ordered on 24th December, 1936, from Messrs. J. I. Thornycroft & Co., Ltd., Southampton.

LARGE REPAIRS.

The large repairs of the Royal Oak were completed at Devonport on 17th August and 23rd December, 1936, respectively, and those of the Repulse at Portsmouth on 11th May, 1936.

The work on the Warspite has been continued at Portsmouth and the ship is due to complete in June, 1937.

The Renown was taken in hand at Portsmouth in September, 1936, for large repairs, including re-engining and re-boilering.

The Valiant will be taken in hand at Devonport about the end of the present financial year for large repairs, including re-engining and re-boilering. Similar work will also be commenced on the Queen Elizabeth at Portsmouth about August, 1937.

The Argus was taken in hand at Devonport in July, 1936, for large repairs and fitting for training service and is due to complete about December, 1937.

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The Cumberland completed large repairs at Chatham in July, 1936, and the Suffolk in January, 1937. The Cornwall was taken in hand for large repairs at Chatham in September, 1936, and is due to complete about November, 1937. The Kent, also undergoing large repairs at Chatham, is expected to complete in April, 1938. The Berwick will be taken in hand for similar work about September, 1937.

The Effingham, the Vindictive, the Hawkins and the Frobisher have had their 7·5-inch armament removed in accordance with the terms of the London Naval Treaty, 1930.

The Effingham was taken in hand for large repairs and re-arming at Devonport in September, 1936, and is expected to complete about October, 1937.

The Vindictive was taken in hand at Portsmouth in June, 1936, for large repairs and fitting out as a cadets' training ship to relieve the Frobisher and is due for completion about July, 1937. The Frobisher and Hawkins will be taken in hand for similar work to the Effingham during the latter part of the financial year 1937.

The conversion of the S.S. Majestic for service as a stationary boys' training vessel is being undertaking by Messrs. J. I. Thornycroft & Co., Ltd., Southampton, and it is expected that the work will be completed early in April, 1937.

Fast Motor Boats.

Further progress has been made with the introduction of planing type motor boats and these boats are being supplied to most classes of warship. Two motor boats of this type have been completed and fitted for bombing target service.

Aircraft Equipment.

The installation of aircraft equipment both in existing ships and new construction has progressed according to programme. New types of catapult and launching trollies have been satisfactorily completed and are on service.

EXTENSION TO CONTRACTORS' PLANT AND WORKS.

In the statement which accompanied the second Supplementary Estimate for 1936 reference was made to the provision for extensions to contractors' plant and works. In the present Estimate provision is made for the development of these schemes on a substantial scale under Votes 8, 9, and 10.

NAVAL WORKS.

The provision for extensions to contractors' works, to which reference is made above, and for the provision of additional factories accounts for a large proportion of the gross increase under the Works Vote.

There is also provision for making progress on certain major works for which sanction has been sought in the Supplementary Estimate now being presented. Amongst these may be mentioned a central magazine depot to provide storage accommodation under conditions of safety, extensions to the factories at Holton Heath and Sheffield, new proof butts at Shoeburyness, modernisation of lifting appliances at Devonport Dockyard and rebuilding at the Research Department at Woolwich.

The extension at Holton Heath is for the manufacture of a modified type of propellant and is due to the necessity for increased production. The Sheffield extension is for the supply of gauges. Both items result from the policy of making good deficiencies.

The rebuilding at Woolwich is for the proper accommodation of the Ballistics Directorate and involves the re-provision of certain buildings of the Proof Branch which will have to be demolished with that end in view.

Major works for which a small provision is made in these Estimates include a new Signal School at Portsmouth to meet Fleet requirements and alterations to No. 3 basin at that port to provide improved berthing accommodation.

In addition to the above items, the building of a new naval hospital will be begun at Hong Kong on a site provided by the Government of the Colony.

Work on the Singapore naval base proceeds satisfactorily, and certain additional work is being carried out to increase the accommodation for capital ships, etc., by about 50 per cent.

ADMIRALTY ADMINISTRATION.

The Board of Admiralty and the Naval Service have suffered a severe loss in the death on 10th July, 1936, of Sir Oswyn Murray, G.C.B., who had occupied the post of Permanent Secretary of the Admiralty for nearly 20 years. The high quality of his services had won for him a position of exceptional distinction and authority. The

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vacancy created by Sir Oswyn Murray's death has been filled by the transfer from the India Office of Sir Archibald Carter, K.C.I.E., C.B.

In the same year the Board have lost the services of their chief technical adviser, Sir Arthur W. Johns, K.C.B., C.B.E., Director of Naval Construction, who retired from the Service through ill-health in July last and died on the 13th January. Sir Arthur Johns had held the post of Director of Naval Construction for six years and his work throughout his long service had been of outstanding merit particularly in relation to submarine design. He has been succeeded by Mr. S. V. Goodall, C.B., O.B.E.

A committee was appointed in May last to report on the Royal Corps of Naval Constructors, and as a result of their investigations certain additional appointments have been made to deal with the greatly increased volume of work. With a view to attracting into the Corps young men with the highest qualifications conditions of service have been carefully reviewed. The pay of the higher grades has been improved and proposals for broadening the basis of recruiting are under consideration, the intention being to give the required technical training to certain recruits after entry.

A committee composed of representatives of the Admiralty, the Board of Trade and shipowners has been formed to ensure that the co-operation which is so necessary in time of war for the protection of shipping shall be closely established in time of peace. The committee will study the measures necessary to ensure the least possible dislocation to our shipping in the event of war.

In May last a Contracts Advisory Committee was set up under the chairmanship of the Right Honourable Sir Malcolm Robertson, G.C.M.G., K.B.E., to assist the Board of Admiralty as necessary in connection with the rearmament programme and especially with a view to preventing profiteering in industry. The Committee has advised the Board on a number of contract questions involving novel conditions arising out of the provision of new manufacturing capacity, and other questions of importance are pending which will be brought before them in due course.

MISCELLANEOUS.

In engineering design generally, the advances made continue to result in less weight and space being required for the machinery installations without prejudice to fuel economy.

A new type of submarine engine is now completed and shop trials indicate that without involving any increase in weight and space occupied, it is likely to be a considerable improvement on the engines it is designed to replace. Orders have been placed for various advanced types of submarine engines so that experience on service may be obtained to meet future requirements.

Close touch is being maintained with the development of oxyhydrogen engines at home and abroad.

Preliminary trials of two different advanced types of forced circulation boilers have been carried out with satisfactory results. Further experience will be obtained ashore and afloat. In addition, three other different designs have been put on service, for comparison with the standard Admiralty type boiler. Noteworthy improvements have been made in the standard type as a result of successful work at the Admiralty Fuel Experimental Station, Haslar.

At the Admiralty Engineering Laboratory work in connection with internal combustion engines has been carried out, including metallurgical experiments, development of existing engines, and preliminary design and construction work on new high powered and high speed compression ignition engines.

The possibility of extending the field from which satisfactory lubricating oils can be drawn, by taking advantage of modern processes of refinement, is being explored.

Steady progress has been made in the application of electric welding to ship construction. The results obtained on service have been satisfactory and encourage further developments.

In co-operation with the armour firms, experimental work on armour has continued.

The new experiment tank at Haslar, completed in 1932, is now fully equipped and is proving of great value in the many problems of ship resistance, propulsion and manœuvrability. Both the new and old tanks have been fully employed throughout the year.

Research and experimental work continue with a view to ensuring that the electrical equipment of the fleet is kept abreast of modern progress.

A committee has been appointed to report on the ventilation arrangements in H.M. Ships, with a view to making recommendations for improving the present system where practicable, to meet modern requirements of hygiene, habitability and defence.

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ABSTRACT OF NAVY ESTIMATES FOR 1937.

Votes.		Estimates 1937. Gross Estimate.	Estimates 1937. Net Estimate.	Estimates 1936.* Net Estimate.
	I.—Numbers.		Maximum Numbers.	Maximum Numbers.
A.	Number of Officers, Seamen, Boys, and Royal Marines	112,000	112,000	101,154
	Number of Royal Marine Police	895	895	892
	II.—Effective Services.	£	£	£
1	Wages, etc., of Officers and Men of the Royal Navy, and Royal Marines, and Civilians employed on Fleet Services	14,231,000	14,181,000	13,610,700
2	Victualling and Clothing for the Navy	4,662,580	3,978,000	3,585,700
3	Medical Establishments and Services	482,160	411,400	397,300
4	Fleet Air Arm	4,200,000	4,200,000	3,572,000
5	Educational Services	280,540	207,500	205,000
6	Scientific Services	676,110	586,000	513,600
7	Royal Naval Reserves	373,440	373,300	355,700
8	Shipbuilding, Repairs, Maintenance, etc.:			
	Section I.—*Personnel*	8,659,230	8,583,000	7,816,700
	Section II.—*Matériel*	11,464,650	8,878,700	9,718,600
	Section III.—Contract Work	32,056,278	14,662,800	17,398,230
9	Naval Armaments	13,382,700	7,769,700	9,473,300
10	Works, Buildings, and Repairs at Home and Abroad	5,194,700	2,093,000	2,811,200
11	Miscellaneous Effective Services	894,700	812,600	824,170
12	Admiralty Office	1,468,470	1,459,000	1,282,100
	Total Effective Services £	98,026,558	68,196,000	71,564,300
	III.—Non-Effective Services.			
13	Naval and Marine, Officers	3,195,045	3,174,000	3,219,000
14	Naval and Marine, Men	5,482,950	5,386,000	5,276,000
15	Civil Superannuation, Compensation Allowances, and Gratuities	1,311,734	1,309,000	1,229,700
	Total Non-Effective Services £	9,989,729	9,869,000	9,724,700
	Grand Total £	108,016,287	78,065,000†	81,289,000

Net Decrease . . . . £3,224,000.

Admiralty.
18 *Feb.*, 1937.

Samuel Hoare
Ernle Chatfield,
M. E. Dunbar-Nasmith,
R. G. H. Henderson,
Percy Noble,
W. M. James,
J. H. D. Cunningham.
Stanley,
Kenneth M. Lindsay,
R. H. A. Carter.

* Including Supplementary Estimates 28 April and 7 July, 1936 (H.C. 85 and 138).

† The Appropriations-in-Aid include sums aggregating £27,000,000, which, subject to statutory authority being obtained in accordance with the Defence (Loans) Bill now before Parliament, will be provided by issues from the Consolidated Fund. The net total of Navy Estimates before deducting the sums to be received from this source is therefore £105,065,000.

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STATEMENT SHOWING THE NUMBERS BORNE, THE EXPENDITURE ON NAVAL SERVICES FOR THE YEARS 1917 TO 1935, AND THE ESTIMATES FOR 1936 AND 1937.

Year	Vote A. — Average numbers borne. (a)	Vote 1. — Wages, &c., of Officers, &c	Vote 2. — Victualling and Clothing.	Vote 3. — Medical Establishments, &c.	Vote 4. — Fleet Air Arm.	Vote 5. — Educational Services.	Vote 6. — Scientific Services.	Vote 7. — Royal Naval Reserves.	Vote 8. — Shipbuilding, Repairs, Maintenance, &c. Section I. Personnel.	Section II. Matériel.	Section III. Contract Work.	Vote 9. — Naval Armaments.	Vote 10. — Works.	Vote 11. — Miscellaneous.	Vote 12. — Admiralty Office.	Vote 13. — Half Pay, &c.	Vote 14. — Naval, &c., Pensions.	Vote 15. — Civil Superannuation, &c.	Balances Irrecoverable.	Total Expenditure
		£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1917	406,977	37,559,536	13,481,159	792,569	561,308	210,243	152,160	874,930	12,660,160	36,494,694	70,609,055	34,177,359	6,556,799	9,193,802	1,454,835	709,227	1,446,247	413,746	41,092	227,388,891
1918	381,311	46,373,511	24,219,351	1,158,287	491,270	247,922	262,886	871,970	15,037,763	59,128,675	94,248,874	64,866,784	10,928,241	9,357,532	1,985,894	704,914	3,733,778	445,485	28,090	334,091,227
1919	176,087	32,385,306	8,823,106	733,046	556,778	401,864	364,832	458,044	12,426,177	Credit :— 785,986	48,348,933	14,441,835	5,595,608	11,118,631	2,042,715	1,176,937	15,133,064	802,279	60,875	154,084,044
1920	124,009	21,314,360	8,311,708	683,830	759,110	503,152	249,185	359,694	12,096,747	6,799,965	12,001,445	8,493,951	4,992,969	5,724,974	2,073,764	2,352,344	4,847,475	880,996	23,611	92,505,290
1921	127,180	19,220,859	6,831,481	643,735	480,243	405,592	359,575	423,056	10,690,188	8,835,771	4,834,336	6,253,468	4,746,485	3,506,514	1,780,641	2,002,201	3,881,368	1,020,693	69,935	75,986,141
																Non-effective Services.				
																Officers.	Men.			
1922	107,782	15,762,232	4,767,118	492,419	258,600	382,065	354,961	423,722	7,075,533	3,877,716	3,225,598	3,678,783	3,553,831	2,096,219	1,371,961	3,701,984	5,471,088	968,880	29,679	57,492,389
1923	99,107	14,175,111	4,153,803	410,842	193,793	330,644	379,489	459,391	6,751,496	5,521,336	4,427,874	3,840,606	3,215,766	982,173	1,247,813	2,856,764	4,260,245	823,340	33,864	54,064,350
1924	99,453	14,150,863	4,152,902	442,756	190,669	334,648	393,054	446,902	7,489,659	5,592,183	5,415,210	3,507,190	3,140,887	1,065,869	1,349,519	2,868,798	4,328,526	811,797	12,355	55,623,787
1925	100,284	14,576,499	4,226,570	440,209	Fleet Air Arm (b) 1,320,000	327,226	417,552	465,114	7,929,259	6,905,184	6,395,406	4,247,113	2,422,050	826,119	1,307,790	2,812,336	4,449,585	928,326	8,110	60,004,548
1926	100,791	14,322,678	4,236,846	434,919	681,000	324,036	393,839	444,759	7,487,952	5,422,141	7,275,173	3,595,037	2,108,441	930,369	1,203,639	2,914,419	4,450,140	894,472	23,002	57,142,862
1927	101,916	14,568,462	4,182,491	423,777	882,000	224,334	402,976	419,086	7,067,419	4,678,052	8,839,423	3,996,749	1,900,788	844,852	1,233,132	2,966,485	4,525,353	965,602	2,276	58,123,257
1928	100,680	14,435,347	3,992,639	418,863	1,008,300	226,486	396,298	403,295	6,743,571	5,074,290	8,263,060	3,871,235	1,950,207	728,841	1,181,125	3,006,321	4,496,310	944,735	4,223	57,139,146
1929	99,300	14,286,313	3,840,098	419,371	1,066,000	226,449	467,343	387,241	6,561,827	4,977,230	7,291,217	3,868,359	2,079,775	725,511	1,194,842	3,075,856	4,550,155	968,944	1,239	55,987,770
1930	94,921	13,996,225	3,531,280	394,505	1,267,000	224,722	470,965	395,648	6,227,647	4,198,553	5,532,728	3,557,624	1,928,639	667,107	1,178,675	3,121,672	4,592,970	983,198	5,033	52,274,186
1931	92,449	13,432,777	3,145,731	379,239	1,126,000	219,367	451,498	394,007	6,331,341	4,517,054	4,717,751	3,326,274	2,399,570	683,774	1,114,266	3,123,312	4,625,833	1,026,306	652	51,014,752
1932	89,667	12,636,077	2,980,931	361,229	1,025,000	207,442	453,149	346,552	6,262,431	4,190,785	5,429,049	3,318,886	2,374,150	562,029	1,086,182	3,125,419	4,741,854	1,060,833	2,455	50,164,453
1933	89,863	12,514,488	3,182,430	376,228	1,089,000	194,742	454,819	373,092	6,192,587	4,351,666	7,905,227	3,767,355	2,243,564	572,722	1,079,214	3,231,172	4,857,822	1,055,710	1,707	53,443,545
1934	91,351	12,688,561	3,146,979	366,069	1,338,000	194,079	455,883	342,052	6,527,160	4,763,966	9,638,067	4,034,459	2,068,310	553,411	1,105,578	3,260,867	5,008,397	1,122,976	1,196	56,616,010
1935	94,259	13,139,921	3,434,985	405,758	1,993,000	198,962	465,666	334,151	7,173,391	6,451,208	12,159,366	5,657,513	2,050,025	789,112	1,155,355	3,181,493	5,102,079	1,173,312	22,316	64,887,613
1936* (estimate)	101,154(b)	13,610,700	3,585,700	397,300	3,572,000	205,000	513,600	355,700	7,816,700	9,718,600	17,398,230	9,473,300	2,811,200	824,170	1,282,100	3,219,000	5,276,000	1,229,700	—	81,289,000
1937 (estimate)	112,000(b)	14,181,000	3,978,000	411,400	4,200,000	207,500	586,000	373,300	8,583,000	8,878,700	14,662,800	7,769,700	2,093,000	812,600	1,459,000	3,174,000	5,386,000	1,309,000	—	78,065,000†

Note.—The figures for Expenditure represent the Net Expenditure after taking into account receipts noted in the Navy Appropriation Accounts as receipts in excess of estimated Appropriations in Aid.

(a) Exclusive of Royal Marine Police.

(b) Maximum bearing.

* Including Supplementary Estimates 28 April and 7 July, 1936 (H.C. 85 and 138).

† See note † on previous page.

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EXPENDITURE FOR NAVAL PURPOSES OF THE PRINCIPAL FOREIGN POWERS.

UNITED STATES NAVY.

Summary of estimates of appropriations for the fiscal year 1937, compared with appropriations for the fiscal year 1936.

Bureau or subdivision.	Appropriations 1936.	Budget Estimates 1937.	Increase (+) or Decrease (—).
Annual appropriations:			
Office of the Secretary	$1,515,470	$1,631,270	+$115,800
Bureau of Navigation	11,889,447	13,509,400	+1,619,953
Bureau of Engineering	20,162,000	20,500,000	+338,000
Less amount reappropriated and made available from the appropriation "General Expenses, Marine Corps, 1933"	—500,000	—	+500,000
Net total appropriation, Bureau of Engineering	19,662,000	20,500,000	+838,000
Bureau of Construction and Repair	18,788,000	19,200,000	+412,000
Less amount reappropriated and made available from the appropriation "General Expenses, Marine Corps, 1933"	—500,000	—	+500,000
Net total appropriation, Bureau of Construction and Repair	18,288,000	19,200,000	+912,000
Bureau of Ordnance	21,700,000	23,500,000	+1,800,000
Less amount reappropriated and made available from the appropriation "Fuel and Transportation, Bureau of Supplies and Accounts, 1934"	—500,000	—	+500,000
Net total appropriation, Bureau of Ordnance	21,200,000	23,500,000	+2,300,000
Bureau of Supplies and Accounts	184,445,823	203,750,000	+19,304,177
Bureau of Medicine and Surgery	2,249,400	2,290,000	+40,600
Bureau of Yards and Docks:			
Exclusive of public works	8,092,800	7,590,000	—502,800
Public Works, Bureau of Yards and Docks (expenditures)	29,971,665	14,775,000	—15,196,665
Less expenditures from balances brought forward from appropriations and allotments for prior years	—11,572,665	—9,775,000	+1,797,665
Net total appropriations, Public Works, Bureau of Yards and Docks	18,399,000	5,000,000	+13,399,000
Total appropriations Bureau of Yards and and Docks	26,491,800	12,590,000	—13,901,800
Bureau of Aeronautics:			
Exclusive of construction of aircraft	14,016,650	17,750,000	+3,733,350
Construction of aircraft	26,715,660	22,250,000	—4,465,660
Total appropriations, Bureau of Aeronautics	40,732,310	40,000,000	—732,310

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UNITED STATES NAVY—*continued.*

Bureau or subdivision.	Appropriations 1936.	Budget Estimates 1937.	Increase (+) or Decrease (—).
Marine Corps	23,768,110	25,432,230	+1,664,110
Departmental salaries	3,895,139	3,993,209	+98,070
Contingent expenses	688,880	695,200	+6,320
Replacement of naval vessels (expenditures)	233,847,208	243,317,778	+9,470,570
Less amounts appropriated and made available from the unobligated balances of certain other appropriations for prior years	—6,000,000	—	+6,000,000
Less expenditures from balances brought forward from appropriations and allotments for prior years	+100,942,208	—60,817,778	+40,124,430
Net total appropriation, replacement of naval vessels	126,905,000	182,500,000	+55,595,000
Total annual appropriations	481,731,379	549,591,299	+67,859,920
Trust Accounts:			
Office of the Secretary	25,000	22,000	—3,000
Bureau of Navigation	300,000	335,000	+35,000
Bureau of Supplies and Accounts	57,500	50,100	—7,400
Bureau of Medicine and Surgery	1,200,000	1,180,000	—20,000
Marine Corps	155,000	130,000	—25,000
Total Trust Accounts	1,737,500	1,717,100	—20,400
Grand Total appropriations and estimates	483,468,879	551,308,399	+67,839,520

The amount finally voted for the year ending June 30, 1937, was $526,546,532.

FRENCH NAVY.

Estimates, 1936.

The figures for 1936, as compared with those for 1935, are as follows :—

	1936. *Francs.*	1935. *Francs.*
Ordinary	1,381,438,557	1,372,255,139
Extraordinary	2,047,464,359	2,023,464,459
Total	3,428,902,916	*3,395,719,598

* A further extraordinary vote of 138,000,000 was approved for 1935.

ROYAL ITALIAN NAVY.

Estimates, 1936–1937.

	1936–37. *Lire.*	1935–36. *Lire.*
Ordinary Expenditure:		
General Expenses	5,023,500	5,023,500
Pensions	98,070,000	98,070,000
Lighthouses and Pilotage	5,589,000	5,589,000
Maintenance, Construction, Armaments, Establishments, and Coast Works	1,235,113,000	1,055,518,000
Extraordinary Expenditure:		
General expenses of the Navy, etc.	201,095,500	506,000,000
Grand Total	1,544,891,000	1,670,200,500

No official figures are published for the German and Japanese Naval Estimates.

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BRITISH AND FOREIGN NAVIES.

PRINCIPAL OFFICIALS.

Great Britain.

First Lord.—The Right Hon. Sir Samuel J. G. Hoare, Bart., G.C.S.I., G.B.E., C.M.G., M.P.
First Sea Lord and Chief of Naval Staff.—Admiral of the Fleet Sir A. Ernle M. Chatfield, G.C.B., K.C.M.G., C.V.O., D.C.L. (Oxon.).
Second Sea Lord and Chief of Naval Personnel.—Admiral Sir Martin E. Dunbar-Nasmith, V.C., K.C.B.
Third Sea Lord and Controller.—Vice-Admiral Sir Reginald G. H. Henderson, K.C.B.
Fourth Sea Lord and Chief of Supplies and Transport.—Vice-Admiral Sir Percy L. H. Noble, K C.B., C.V.O.
Deputy Chief of Naval Staff.—Vice-Admiral Sir W. M. James, K.C.B.
Assistant Chief of Naval Staff.—Rear-Admiral J. H. D. Cunningham, M.V.O.
Civil Lord.—Kenneth M. Lindsay, Esq., M.P.
Parliamentary and Financial Secretary.—The Right Hon. Lord Stanley, M.C., M.P.
Permanent Secretary.—Sir R. H. Archibald Carter, K.C.I.E., C.B.

Foreign Powers.

Country.	Minister of Marine.	Chief of Staff.
Argentina	Captain Eleazer Videla	Captain Léon Scasso
Brazil	Vice-Admiral Henrique Aristides Guilhem	Vice-Admiral Amphiloquio Reis
Chile	Don Emilio Bello Codecido (Minister of National Defence) Rear-Admiral Reyes del Rio (Director-General of the Navy)	Rear-Admiral Vicente Merino ——
China	Admiral Chen Shao-Kwan (Minister of Naval Affairs)	Rear-Admiral Chen Hsiun Yung (Vice-Minister)
Colombia	——	Rear-Admiral S. O. Bell-Salter
Denmark	A E Anderson Vice-Admiral H. Rechnitzer (Chief of Naval Defence and Director of the Naval Ministry)	Rear-Admiral A. G. Topsoe Jensen
Ecuador	Colonel Benigno Andrade Flores	Captain de Navio Anda (Director of the Fleet)
Estonia	General Lill (Minister of Defence)	General N. Reek
Finland	A. Oksala (Minister of Defence) Lieut.-General V. Öesterman (Chief of Army and Navy)	Major-General Oesch
France	M. A. Gasnier Duparc	Vice-Admiral G. E. J. Durand-Viel
Germany	General von Blomberg (Minister of War) Admiral Dr. Raeder (Chief of Navy Department (Admiralty)	Admiral Foerster (C.-in-C. of Fleet)
Greece	General Metaxas	Vice-Admiral D. Economo (C.-in-C.)
Italy	Signor Mussolini	Admiral D. Cavagnari
Japan	Admiral Osami Nagano	H.I.H. Prince Hiroyasu Fushimi, G.C.V.O.
Latvia	General Balodis (Minister of Defence)	Captain Spade (Chief of Naval Forces)
Lithuania	Colonel Stasys Dirmantas	——
Mexico	General Quiroga (Minister of War and Marine)	Rear-Admiral P. O. Blanco
Netherlands	Dr. Colijn (Minister of Defence) (temporarily)	Rear-Admiral J. T. Fürstner
Norway	C. F. Monsen (Minister of Defence)	Rear-Admiral E. Otto
Paraguay	——	Cdr. D. M. Aponte (Director of the Navy)
Peru	Captain Hector Mercado (Minister of Marine and Aviation)	Captain Frederico Diaz Dulanto
Poland	General Rydz-Smigly	Rear-Admiral J. Swirski (Chief of Navy Department)
Portugal	Lieut.-Cdr. M. Ortins-Bettencourt	Rear-Admiral J. A. de O. Muzanty
Roumania	Admiral Barbuneanu	Commander E. Rosca
Siam	Luang Bibul (Minister of Defence)	Eng. Captain Phya Chakrakich (C.-in-C.)
Soviet Union	K. E. Voroshilov (President of Committee of Defence)	Fleet Flagman (1st Class) V. M. Orlov
Spain	Don José Giral Pereira	Vice-Admiral Xavier de Salas y Gonzalez
Sweden	Janne Nillson (Minister of Defence)	Vice-Admiral Ch. de Champs
Turkey	Captain Sait Halman (Under-Secretary for the Navy)	Rear-Admiral Chukri
United States	C. Swanson (Secretary of the Navy)	Admiral W. H. Standley (Chief of Naval Operations)
Uruguay	General Domingo Mendivil (Minister of War and Marine) Dr. Augusto Sado (Under-Secretary)	Rear-Admiral Arturo Juambeltz (Director of Navy)
Yugoslavia	General Mariche (Minister of War and Marine) Rear-Admiral M. L. Polic (Head of Navy)	Captain S. Banekovic

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BRITISH AND FOREIGN NAVAL ATTACHÉS.

British Naval Attachés Accredited to Foreign Countries.

To :—

Albania and Italy: Naval Attaché, Captain R. H. Bevan, R.N. (appointed 2nd August, 1936); Assistant Naval Attaché, Commander (E.) R. Cobb (appointed 23rd August, 1935); Headquarters, Rome, Italy.

Belgium, France, Netherlands, Portugal and Spain: Naval Attaché, Captain C. F. Hammill, R.N. (appointed 8th October, 1934); Assistant Naval Attaché, Commander (E.) R. Cobb (appointed 23rd August, 1935); Headquarters, Paris, France.

Denmark, Esthonia, Finland, Germany, Latvia, Lithuania, Norway, Poland and Sweden: Naval Attaché, Captain T. H. Troubridge, R.N. (appointed 23rd July, 1936); Assistant Naval Attaché, Commander (E.) R. Cobb (and Assistant to Naval Attachés, Paris and Rome); Headquarters, Berlin, Germany.

Japan and China: Naval Attaché, Captain H. B. Rawlings, O.B.E., R.N. (appointed 3rd January, 1936); Assistant Naval Attaché, Commander (E.) A. D. Merriman, R.N. (appointed 5th May, 1936); Headquarters, Tokyo, Japan.

U.S.A., Cuba, Mexico, and Panama: Naval Attaché, Captain F. C. Bradley, R.N. (appointed 19th June, 1935); Assistant Naval Attaché, Engineer-Commander A. L. P. Mark-Wardlaw (appointed 28th July, 1934): Headquarters, Washington, U.S.A.

South America, including the Argentine Republic, Brazil, Chile, Ecuador, Peru, and Uruguay: Naval Attaché, Captain P. J. Mack, R.N. (appointed 28th December, 1935); Headquarters, Buenos Aires.

Roumania and Bulgaria: Captain H. Clanchy (acting) (appointed 17th October, 1936); Headquarters, Moscow.

Siam: Naval Attaché, Commander G. R. G. Allen, O.B.E., R.N. (appointed 28th May, 1935); Headquarters, Bangkok.

Foreign Naval Attachés Accredited to Great Britain.

From :—

Argentine: Captain Mario Fincati. Argentine Naval Commission:—Captain Mario Fincati, Commander Francisca Renta, Commander M. A. Parra, 171, Victoria Street, S.W.1.

Belgium: Lieutenant-General Baron Vincotte, C.V.O., D.S.O. (Military Attaché), Belgian Embassy, 103, Eaton Square, S.W.1.

Brazil: Engineer Captain Natal Arnaud, Brazilian Embassy, 19, Upper Brook Street, Mayfair, W.1.

Chili: Commander Don Francisco Beduneau, 76, Victoria Street, S.W.1. Chilian Naval Commission: Rear-Admiral C. Rogers, C.N. (retd.), 76, Victoria Street, S.W.1.

China: Post Vacant.

Denmark: Post Vacant.

Finland: Commander Holger Gröndahl, 37, Smith Square, Westminster, S.W.1.

France: Captain de Frégate Comte du Tour, French Embassy, Albert Gate House, S.W.1.

Germany: Rear-Admiral Erwin Wassner, German Embassy, 7, Carlton House Terrace, S.W.1.

Greece: Post vacant.

Italy: Captain Bruno Brivonesi; Assistant Naval Attaché Capitano del Genio Navale Gino Iori, 4, Three Kings' Yard, Davies Street, W.1.

Japan: Captain R. Fujita, I.J.N.; Assistant Naval Attachés, Commander Y. Yamamoto, I.J.N., Lieutenant M. Nango, I.J.N., Broadway Court, Westminster, S.W.1.

Netherlands: Lieutenant-Commander A. de Booy, Netherlands Legation, 21A, Portman Square, W.1.

Norway: Post vacant.

Peru: Post vacant.

Poland: Post vacant.

Portugal: Post vacant.

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Roumania: Captain Georghe St. Dumitrescu, Assistant, Captain Cezar Marinescu, 4, Cromwell Place, S.W.7.

Soviet Union: Engineer-Flagman Lev Vladimirovich Antsipo-Chikunski, 89, Addison Road, W.14.

Spain: Commander Fernando Navarro Y. Capdevila, 24, Belgrave Square, S.W.1. Spanish Naval Commission: Commander Fernando Navarro Y. Capdevila, 64, Victoria Street, S.W.1.

Sweden: Commander G. E. F. Boldt-Christmas, Swedish Legation, 27, Portland Place, W.1.

Turkey: Capitaine de Corvette Rijat Ozdes, 4, Grosvenor Gardens, S.W.1.

U.S.A.: Captain W. S. Anderson, U.S.N.; Assistant Naval Attachés, Captain J. A. Furer, U.S.N. (C.C.), Lieutenant Elliot B. Strauss, U.S.N., Lieutenant H. A. Guthrie, U.S.N., Lieut.-Commander L. C. Stevens, U.S.N. (C.C.), 4, Grosvenor Gardens, S.W.1.

Uruguay: Post vacant.

Yugoslavia: Colonel George S. Glischitch, Naval and Military Attaché, and Air Attaché, 195, Queen's Gate, S.W.7.

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PROFILES OF
BRITISH AND FOREIGN WARSHIPS

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CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance **with the number of funnels and masts,** as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 201–242. All the profiles are drawn to the scale ½ in. = 100 ft.]

[Indexes to the names of vessels of which profiles are included in this section are given at the end of the volume.]

FRANCE. Battleships. Condorcet, Diderot, Voltaire.
(Diderot has a tall mainmast.)

SWEDEN. Battleship. Oscar II.

GREAT BRITAIN. Battle-cruiser. Hood.

GREAT BRITAIN. Battle-cruiser. Repulse (after reconstruction 1936).
Renown now undergoing reconstruction will be similar.

JAPAN. Battleships. Mutsu, Nagato.

Digitized by Google

JAPAN. Battleships. Ise, Hyuga.

JAPAN. Battleships. Fuzo and Yamashiro.
(After reconstruction, 1934.)

JAPAN. Battleships. Haruna, Kirishima, Kongo.

CHILE. Battleship. Almirante Latorre.
(Modernised 1931—mainmast raised and bridge work altered.)

UNITED STATES. Battleships. California, Colorado, Maryland, Tennessee, West Virginia.
(Now fitted with 2 catapults, one on "X" turret and one on the quarter deck.)

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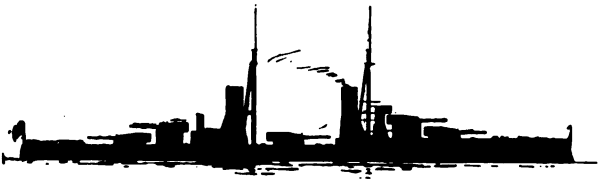
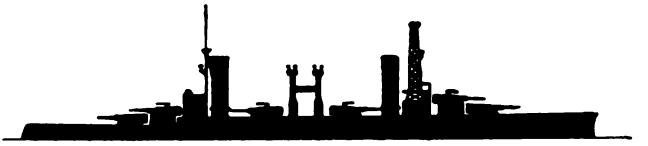


ITALY.* Battleships. Andrea Doria, Caio Duilio.

ITALY.* Battleships. Conte di Cavour, Giulio Cesare.

* NOTE.—The above 4 Italian battleships are being modernised. Bow is being lengthened by 52 ft., midships turret removed and 2 catapults fitted.

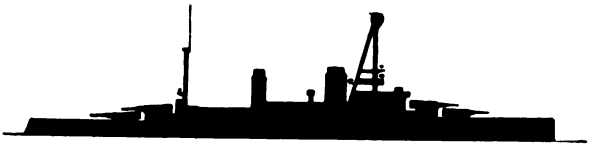
UNITED STATES. Battleship. Arkansas.



ARGENTINE. Battleships. Moreno, Rivadavia.

FRANCE. Battleships. Bretagne, Lorraine, Provence.

NOTE.—Lorraine has been modernised. The midships turret has been removed and replaced by a hangar.



FRANCE. Battleships. Courbet, Jean Bart, Paris.

Digitized by Google

BRAZIL. Battleships. Minas Geraes, São Paulo.

SOVIET UNION. Battleships. Marat and Paris Commune.

TURKEY. Battle-cruiser. Yavouz Sultan Selim.

GREAT BRITAIN. Battleships. Nelson, Rodney.

FRANCE. Battleship. Dunkerque.

GREAT BRITAIN. Battleships. Queen Elizabeth, Warspite, Barham, Valiant, Malaya.
NOTE.—Barham has tripod mainmast and catapult on "X" turret. Valiant has a catapult on the quarter deck. Warspite and Malaya are being reconstructed.

UNITED STATES. Battleships. New York, Texas.

Digitized by Google

GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge, Royal Oak, Royal Sovereign.

NOTE.—Resolution has a smoke deflector on the funnel. Royal Oak, Ramillies and Resolution have a catapult on "X" turret and a crane abreast mainmast.

UNITED STATES. Battleships. Idaho, Mississippi.
(After modernisation, 1934.)

UNITED STATES. Battleships. Arizona, Pennsylvania.

UNITED STATES. Battleships. Nevada, Oklahoma.

SPAIN. Battleship. Jaime I.

GERMANY. Armoured Ships. Admiral Scheer, Admiral Graf Spee.

GERMANY. Armoured Ship. Deutschland.

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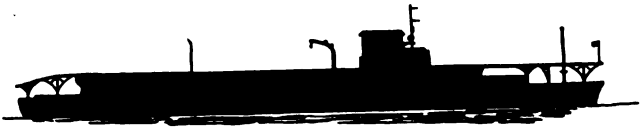
AIRCRAFT AND SEAPLANE CARRIERS AND TENDERS.

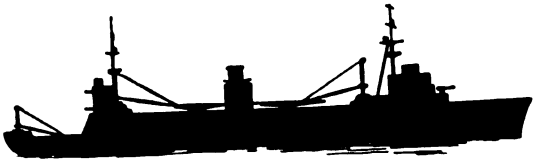
GREAT BRITAIN. Aircraft Carrier. Eagle.

SWEDEN. Aircraft Cruiser. Gotland.

GREAT BRITAIN. Aircraft Carrier. Hermes.



FRANCE. Aircraft Carrier. Béarn.



FRANCE. Aviation Transport. Commandant Teste.

ROYAL AUSTRALIAN NAVY. Seaplane Carrier. Albatross.

Digitized by Google

UNITED STATES. Aircraft Carriers. Saratoga, Lexington.

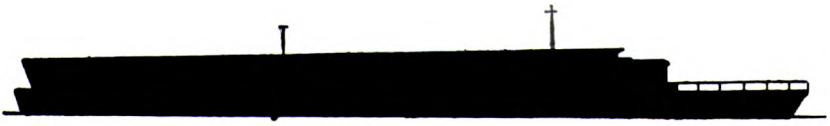
GREAT BRITAIN. Aircraft Carriers. Courageous, Glorious.

NOTES.—The flight deck of Glorious has been lengthened aft, and now extends to the stern. The quarter deck has also been raised a deck.

JAPAN. Aircraft Carrier. Hosho.

GREAT BRITAIN. Aircraft Carrier. Furious.

NOTE.—Quarter deck has been raised one deck.



JAPAN. Aircraft Carrier. Akagi.

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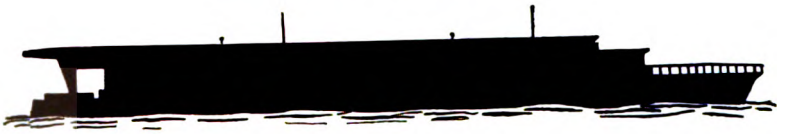
AIRCRAFT CARRIERS.



JAPAN. Aircraft Carrier. Kaga.

UNITED STATES. Aircraft Carrier Ranger.
(NOTE.—Funnels hinge outboard.)

GREAT BRITAIN. Aircraft Carrier. Argus.

JAPAN. Aircraft Carrier. Ryujo.

UNITED STATES. Aircraft Carrier. Langley.

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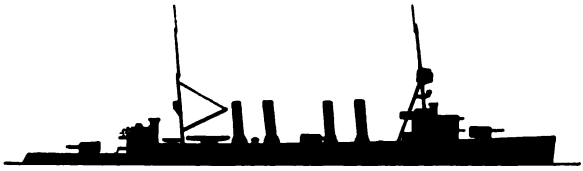
CRUISERS AND COAST DEFENCE SHIPS.

JAPAN. Cruisers. ("Sendai" class.) Naka, Sendai, Jintsu.

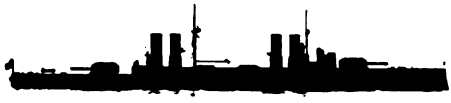


UNITED STATES. Scout Cruisers. ("Omaha" class.) Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.

(There are small differences in the arrangement of guns aft.)

JAPAN. Cruisers. ("Chikuma" class.) Hirado, Yahagi.

ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.



ITALY. Armoured Cruisers. (Classified as Battleships, 2nd class, in Italian official lists.) San Giorgio, San Marco.

ITALY. Light Cruiser. Taranto (*ex-German* Strassburg).

Digitized by Google

GREAT BRITAIN. Cruisers. ("London" class.) Devonshire, London, Shropshire, Sussex. ("Norfolk" class.) Dorsetshire, Norfolk.

GREAT BRITAIN. Cruisers. ("Kent" class.) Berwick, Cornwall, Kent. Cumberland and Suffolk have been modified as below.

COMMONWEALTH OF AUSTRALIA. Cruisers. ("Kent" class.) Australia, Canberra.

GREAT BRITAIN. Cruisers. ("Kent" class.) Cumberland and Suffolk (as reconstructed 1936).

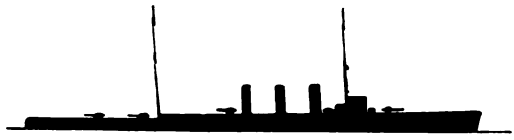
GREAT BRITAIN. Cruisers. ("E" class.) Emerald, Enterprise.
(In Enterprise the forward 6-in. guns are in a twin mounting on the forecastle deck.)

JAPAN. Light Cruisers. ("Kuma" class.) Kiso, Kitakami, Kuma, Oi, Tama. ("Natori" class.) Isudzu, *Natori, *Nagara, *Yura, *Kinu, *Abukuma.
* Has aircraft hangar incorporated in bridge structure.

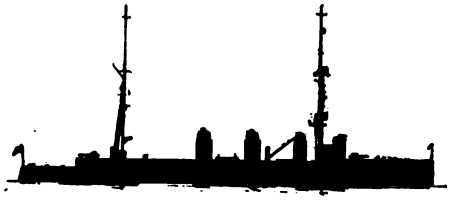
JAPAN. Light Cruisers. "Tenryu" class.) Tatsuta, Tenryu.

Digitized by Google

SPAIN. Light Cruiser. Mendez Nuñez.



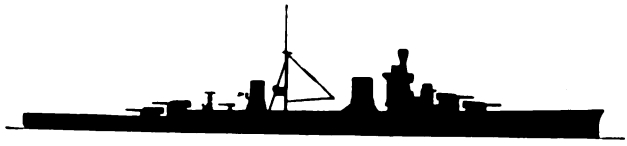
SPAIN. Light Cruiser. Republica.



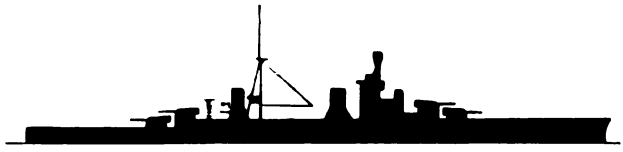
ITALY. Scout Cruiser. Quarto.

JAPAN. Cruisers. ("Nachi" class.) Nachi, Myoko, Ashigara, Hagure.

JAPAN. Cruisers. ("Takao" class.) Takao, Atago, Chokai, Maya.



ITALY. Cruiser. (Modified "Trento" class.) Bolzano.



ITALY. Cruisers. ("Zara" class.) Pola, Zara, Fiume, Gorizia.

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JAPAN. Cruisers. ("Furutaka" class.) Furutaka, Kaka.
(The tops of the funnels are square to the funnels.)

JAPAN. Cruisers. ("Furutaka" class.) Aoba, Kinugasa.
(The tops of the funnels are square to the funnels.)

GREAT BRITAIN. Cruisers. (Improved "Birmingham" class.) Effingham, Frobisher, Hawkins, Vindictive.
(In **Vindictive** the raised 7·5-in. gun forward is removed and a hangar fitted forward of the bridge.)
NOTE.—These ships are being rearmed, the 7·5-inch guns being removed.

FRANCE. Cruisers. ("Duquesne" class.) Duquesne, Tourville. ("Suffren" class.) Suffren, Colbert, Foch, Dupleix.
(**Colbert, Dupleix** and **Foch** have tripod mainmasts and the catapults between the funnels.)

UNITED STATES. Cruisers. ("Astoria" class.) Astoria, New Orleans, Minneapolis, San Francisco, Tuscaloosa.

UNITED STATES. Cruisers. Portland and Indianapolis.

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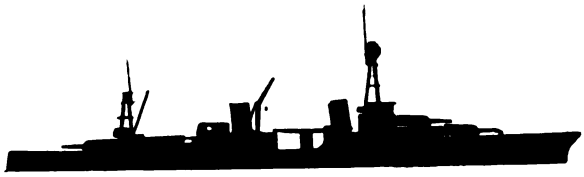
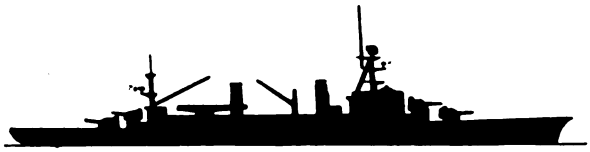
UNITED STATES. Cruisers. ("Pensacola" class.) Salt Lake City, Pensacola.



UNITED STATES. Cruisers. ("Chester" class.) Northampton, Chester, Louisville. ("Augusta" class.) Chicago, Houston, Augusta.



FRANCE. Training Cruiser. Jeanne d'Arc.
(The catapults are removed).

FRANCE. Cruisers. Jean-de Vienne, La Galissonnière, Marseillaise, Gloire, Montcalm, Georges Leygues.

GREAT BRITAIN. Cruisers. York and Exeter. ("York" class.)
In Exeter the funnels and masts are vertical.)

GREAT BRITAIN. Cruisers. ("Amphion" class.) Amphion, Apollo.
COMMONWEALTH OF AUSTRALIA. ("Amphion" Class.) Sydney.

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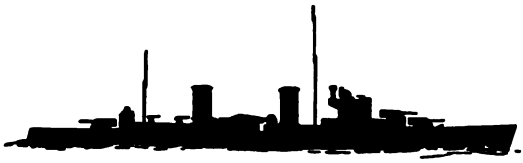

GREAT BRITAIN. Cruisers. ("Arethusa" class.) Arethusa, Galatea, Penelope, Aurora.

GERMANY. Light Cruisers. Köln, Karlsruhe, Konigsberg.

FRANCE. Cruiser Minelayer. Emilé Bertin.

ITALY. Cruisers. ("Condottieri" class.) Montecuccoli, Muzio Attendolo.

ITALY. Cruisers. ("Attendolo" class.) Eugenio di Savoia, Filiberto Duca d'Aosta.

ITALY. Cruisers. ("Condottieri" class.) Alberico de Barbiano, Alberto di Giussano, Bartolomeo Colleoni, Giovanni della Bande Nere.

ITALY. Cruisers. "Condottieri" class.) Armando Diaz, Luigi Cadorna.

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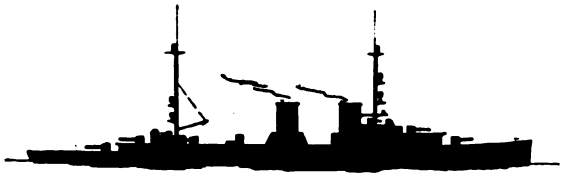
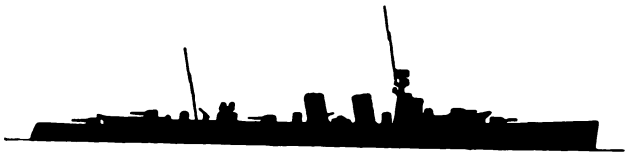
GREAT BRITAIN. Cruiser Minelayer. Adventure. (Stern has been extended.)



NETHERLANDS. Cruisers. Java, Sumatra.

ITALY. Cruisers. ("Trento" class.) Trento, Trieste.

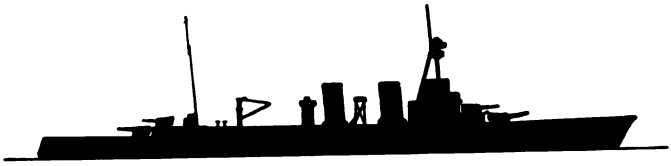


SPAIN. Cruisers. Libertad, Almirante Cervera, Miguel de Cervantes.
(The mainmasts are tripods.)

GERMANY. Light Cruiser. Emden.

FRANCE. Cruiser Minelayer. Pluton.

Digitized by Google



FRANCE. Cruisers. ("Duguay-Trouin" class.) La Motte Picquet, Duguay-Trouin, Primauguet.

GREAT BRITAIN. Cruisers. ("D" class.) Danae, Dauntless, Dragon.

GREAT BRITAIN. Cruisers. ("D" class: repeat vessels.) Delhi, Dunedin, Diomede, Despatch, Durban.

GREAT BRITAIN. Cruisers. ("Ceres" class.) Cardiff, Ceres, Curacoa.
For Coventry and Curlew, see below.

GREAT BRITAIN. Cruisers. ("Ceres" class.) Coventry and Curlew (as rearmed 1935).

GREAT BRITAIN. Cruisers. ("Carlisle" class.) Cairo, Calcutta, Capetown, Carlisle, Colombo.

GREAT BRITAIN. Cruisers. ("Caledon" class.) Caledon, Calypso, Caradoc.

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GREAT BRITAIN. Cruisers ("Cambrian" class.) Castor, Constance.

SOVIET UNION. Cruiser. Krasni Kavkaz.

GREECE. Cruiser. Helle.

SWEDEN. Coast Defence Ships. Gustav V, Sverige.
(Drottning Victoria at present has two funnels and a tripod mainmast, but is to be reconstructed and modernised as above.)

JAPAN. Cruisers. Mikuma, Mogami, Suzuya, Kumano, Tone, Tikuma.

SPAIN. Cruisers. Baleares, Canarias.

FRANCE. Cruiser. Algérie.

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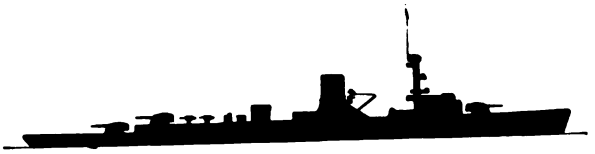
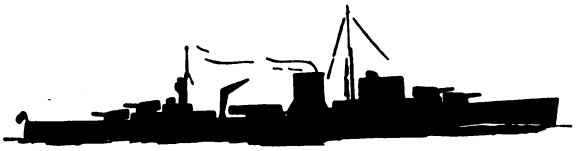


GERMANY. Light Cruiser. Leipzig.



GREAT BRITAIN. Cruisers. ("Leander" class.) Leander, Achilles, Neptune, Orion.

NETHERLANDS. Cruiser. De Ruyter.

ARGENTINE. Cruisers. Almirante Brown, Vinticinco de Maio.

JAPAN. Light Cruiser. Yubari.

FINLAND. Armoured Gunboats. Vaïnämöinen, Ilmarinen.

NORWAY. Minelaying and Training Ship. Olav Trygvason.

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FLOTILLA LEADERS AND DESTROYERS

(See pp. 250–277.)

FRANCE. Flotilla Leaders. Cassard, Vauquelin, Kersaint, Tartu, Maillé Brézé, Le Chevalier Paul.

FRANCE. Flotilla Leaders. Bison, Guépard, Lion, Vauban, Valmy, Verdun.

UNITED STATES. Destroyers. Aylwin, Balch, Benham, Duncan, Parker, Cassin, Cummings and Downes.

Sampson, Rowan, Davis, Allen, Wilkes, Shaw, Tucker, Conyngham, Porter, Wadsworth, Wainwright, O'Brian, Nicholson, Winslow, McDougal, Cushing and Ericsson, are generally similar.

UNITED STATES. Destroyers. The "Flush Deck" type; all U.S. destroyers except those in the preceding silhouette and those with three funnels.

FRANCE. Destroyers. Téméraire, Opiniâtre.

FRANCE. Destroyers. Enseigne Roux, Mécanicien Principal Lestin.

FRANCE. Destroyer. Enseigne Gabolde.

FRANCE. Flotilla Leaders. Tigre, Chacal Jaguar, Léopard, Panthère, Lynx.

FRANCE. Destroyers. Mistral, Cyclone, Bourrasque, Orage, Ouragon, Simoun, Siroco, Tempête, Tramontane, Typhon, Trombe, Tornado.

POLAND. Destroyers. Burza, Wicher, are similar.

FRANCE. Flotilla Leaders. "Le Fantasque" class (6 ships).

FRANCE. Destroyers. Algérien, Annamite, Arabe, Bambara, Hova, Kabyle, Marocain, Sakalave, Sénégalais, Somali, Tonkinois, Touareg.

ITALY. Destroyers. Gen. A. Cantore, Gen. A. Chinotto, Gen. A. Papa, Gen. A. Cascino, Gen. M. Prestinari, Gen. C. Montanari, A. Bassini, E. Cosenz, F. Stocco, G. Carini, G. Medici, G. Acerbi, G. la Farina, G. la Masa, G. Sirtoti, N. Fabrizi, V. Orsini.

YUGO SLAVIA. Flotilla Leader. Dubrovnik.

JAPAN. 1st Class Destroyers. "Fubuki" class. (24 ships.)

FRANCE. Flotilla Leader. Amiral Sénès.

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ITALY. Flotilla Leaders (Scouts). "Navigatori" class. A. da Mosto, etc. (12 ships.)

ITALY. Flotilla Leaders (Scouts). Leone, Pantera, Tigre.

JAPAN. 1st Class Destroyers. "Mutsuki" class (12 ships), and "Kamikase" class (9 ships).

JAPAN. 1st class Destroyers. "Minekase" class (15 ships).

GERMANY. Destroyers. Iltis, Wolf, Tiger, Luchs, Jaguar, Leopard, Seeadler, Greif, Albatros, Kondor, Falke, Möwe.

GREAT BRITAIN. Flotilla Leader. Codrington.

GREAT BRITAIN. Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes.

Flotilla Leaders. Keith, Duncan and Kempenfelt.

PORTUGAL. Destroyers. Vouga, Lima, Dao.
COLOMBIA. Destroyers. Antioquia, Caldas.

ARGENTINE. Flotilla Leaders. Mendoza, La Rioja, Tucuman.

ITALY. Flotilla Leaders (Scouts). Carlo Mirabello, Augusto Riboty.

GREAT BRITAIN. Flotilla Leaders. Broke, Keppel, Shakespeare, Spenser, Wallace, Bruce, Douglas, Campbell, Mackay, Malcolm, Montrose, Stuart. [In Stuart the torpedo tubes are removed.]

SPAIN. Flotilla Leaders. Almirante Valdes, etc., generally similar.

HOLLAND. Destroyers. De Ruyter, Evertsen, Piet Hein, Kortenaer, Banckert, Van Nes, Van Galen, Witte de With.

GREAT BRITAIN. Destroyers. Vanessa, Vanity, Vanoc, Vanquisher, Vectis, Vega, Velox, Vendetta, Venetia, Venturous, Verdun, Versatile, Vesper, Vidette, Vimiera, Violent, Vivacious, Vivien, Vimy (*late* Vancouver), Vortigern, Valhalla, Valentine, Valkyrie, Valorous, Vampire, Viceroy, Viscount, Voyager, Wakeful, Walker, Walpole, Walrus, Warwick, Watchman, Waterhen, Wessex, Westcott, Westminster, Whirlwind, Whitley, Winchelsea, Winchester, Wolfhound, Wolsey, Woolston, Wrestler, Wryneck.

GREAT BRITAIN. Destroyers. Whitehall, Whitshed, Wildswan, Witherington, Wivern, Wolverine, Worcester, Wishart, Witch.

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GREAT BRITAIN. Destroyers. Ambuscade, Amazon.

CHILE. Destroyers. Serrano, Orella, Riquelme, Hyatt, Videla, Aldea.

SWEDEN. Destroyers. Klas Horn, Klas Uggla, Ehrenskild, Nordenskjold.

JAPAN. 2nd class Destroyers. "Wakatake" class (7 ships), and "Kaya" class (19 ships).

FRANCE. Destroyers. Aventurier, Intrépide.

ITALY. Destroyers. Q. Sella, B. Ricasoli, F. Crispi, G. Nicotera.

ITALY. Destroyers. Alessandro Poerio and Guglielmo Pepe.

JAPAN. Destroyers. "Hibiki" class.

GREAT BRITAIN. Flotilla Leader. Exmouth.

GREAT BRITAIN. Destroyers. Admiralty "S" class.

ITALY. Destroyers. Palestro, San Solferino, Martino, Confienza.

ITALY. Destroyers, Turbine. Nembo, Euro, Boreo, Espero, Ostro, Zeffiro, Aquilone, N. Sauro, F. Nullo, D. Manin, C. Battisti.

DENMARK. Torpedo Boats (1st Class). Glentin, Hogen, Ornen, Laxen, Dragen, Hvalen.

UNITED STATES. Destroyers. "Farragut" class.

ITALY. Destroyers. Dardo, Freccia, Strale, Saetta, Folgore, Lampo, Baleno, Fulmine.

GREECE. Destroyers, Hydra, Spetzai, Psara and Coundouriotis.

JAPAN. Destroyers. "Ariake" class (17 ships).

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PLANS OF
BRITISH AND FOREIGN WARSHIPS

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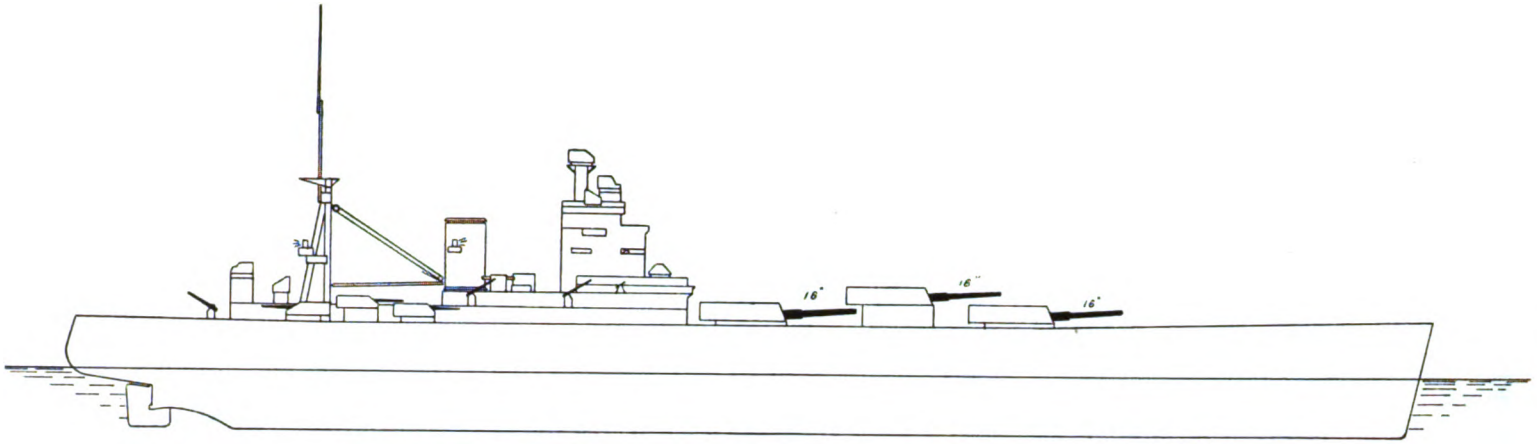
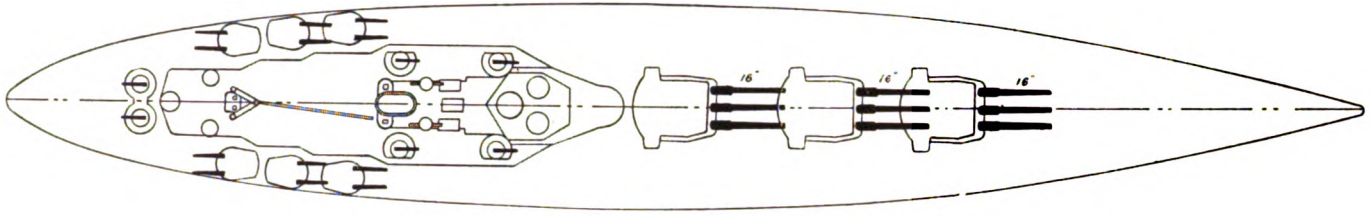
GREAT BRITAIN.

BATTLESHIPS.

Nelson. **Rodney.**





Length (extreme), 710 ft.; Rodney, 33,900 tons; Nelson, 33,500 tons; Speed, 23 knots.
Armament, 9—16-in.; 12—6-in.; 6—4·7-in. A.A.; 4—3-pr.; 6—2-pr. Pom Poms; 11 L.; 5 M.; 2 24-in. submerged torpedo tubes.

NOTE.—A 14-in. waterline armour belt extends from approximately the foremost 16-in. turret to approximately the aftermost 6-in. turret. The turret armour varies from 16-in. to 9-in.

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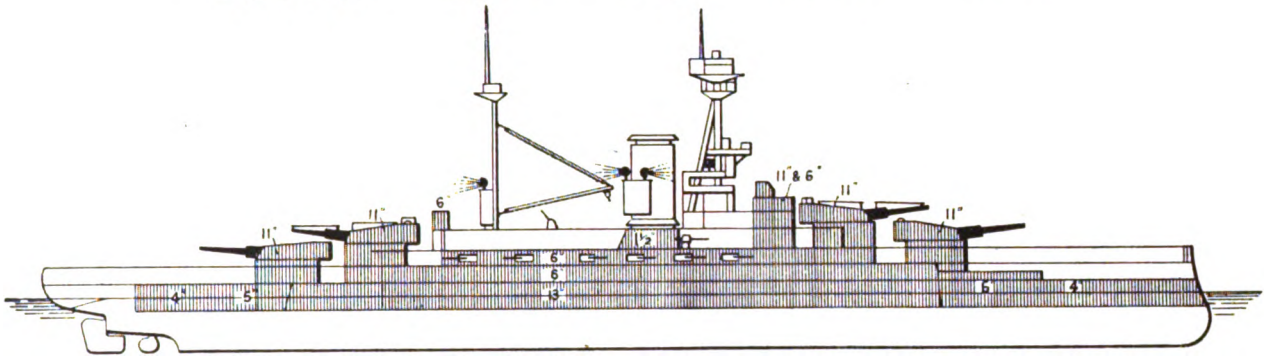
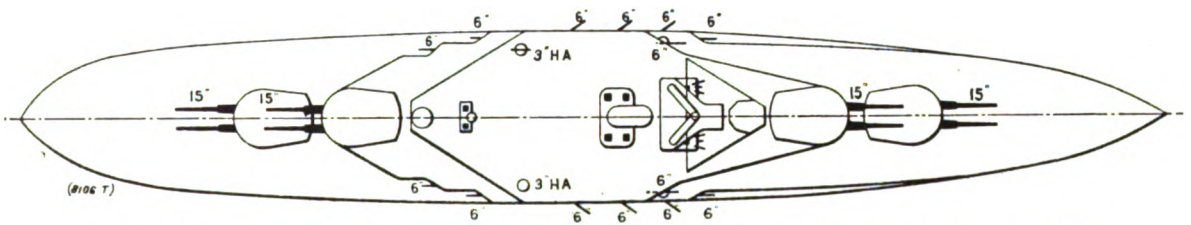
GREAT BRITAIN.

BATTLESHIPS.

Royal Sovereign. Royal Oak. Revenge. Resolution. Ramillies.





Length (extreme), 620 ft. 6 ins.* ; Length B.P., 580 ft. ; 29,150 tons ; Speed, 23 knots (without bulges) ; Completed, 1916–17.
Armament, 8—15 in. ; 12—6 in. ; 4—4-in. A.A. ; 4—3-pr. ; 5 M ; 11 L. ; 2—21-in. submerged torpedo tubes.

Corrections to plan :—Searchlights on mainmast and the superstructure 6-in. guns now removed. Four 4-in. A.A. guns are fitted on the superstructure instead of the 3-in. H.A. shown.

*** Revenge, 625 ft. 9 in.**

Resolution, Royal Oak and Ramillies have a catapult on "X" Turret and a crane abreast the mainmast, and carry 1 aircraft each.

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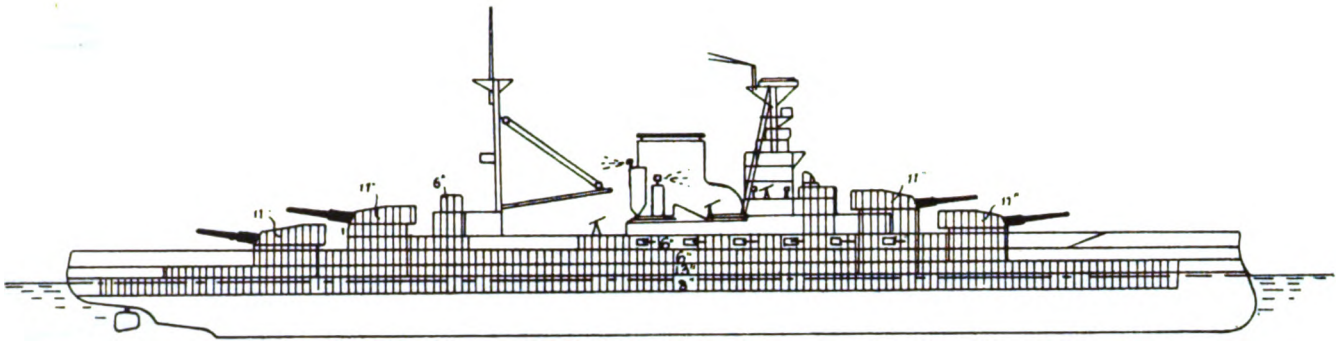
GREAT BRITAIN.

BATTLESHIPS.

Queen Elizabeth. Warspite. Barham. Valiant. Malaya

(As reconstructed 1926-31.)



Length B.P., 600 ft. ; (extreme 639¾—644½ ft.) ; 31,100 tons ; Speed, 25 knots (without bulges) ; Completed, 1915–1916.
Armament, 8—15-in. ; 12—6-in. ; 4—4-in. A.A. ; 4—3-pr. ; 5 M. ; 11 L. ; 2—21-in. submerged torpedo tubes.

NOTES.—Barham has tripod mainmast and catapult on "X" Turret. Valiant has a catapult on the quarter deck. Malaya and Warspite are still under reconstruction.

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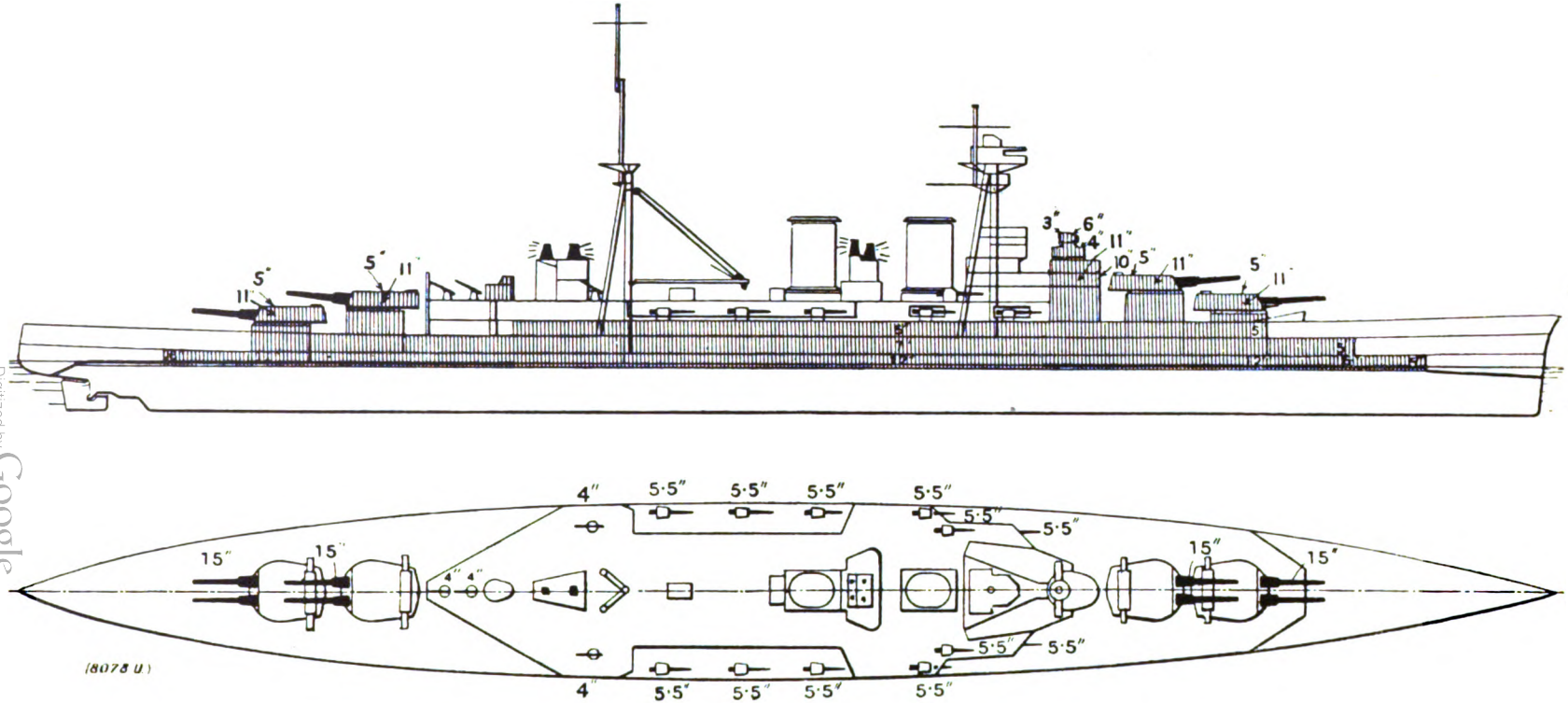
GREAT BRITAIN.

BATTLE-CRUISER.

Hood.



Length (extreme), 860 ft. 10 ins.; Length B.P., 810 ft.; 42,100 tons; Speed, 31* knots; Completed, 1920.
Armament, 8—15-in.; 12—5·5-in.; 4—4-in A.A.; 4—3-pdr.; 5 M.; 11 L.; 4 A.W. and 2 sub. 21-in. torpedo tubes.

*** Trials at 44,600 tons, 31·89 knots with 151,000 S.H.P.**

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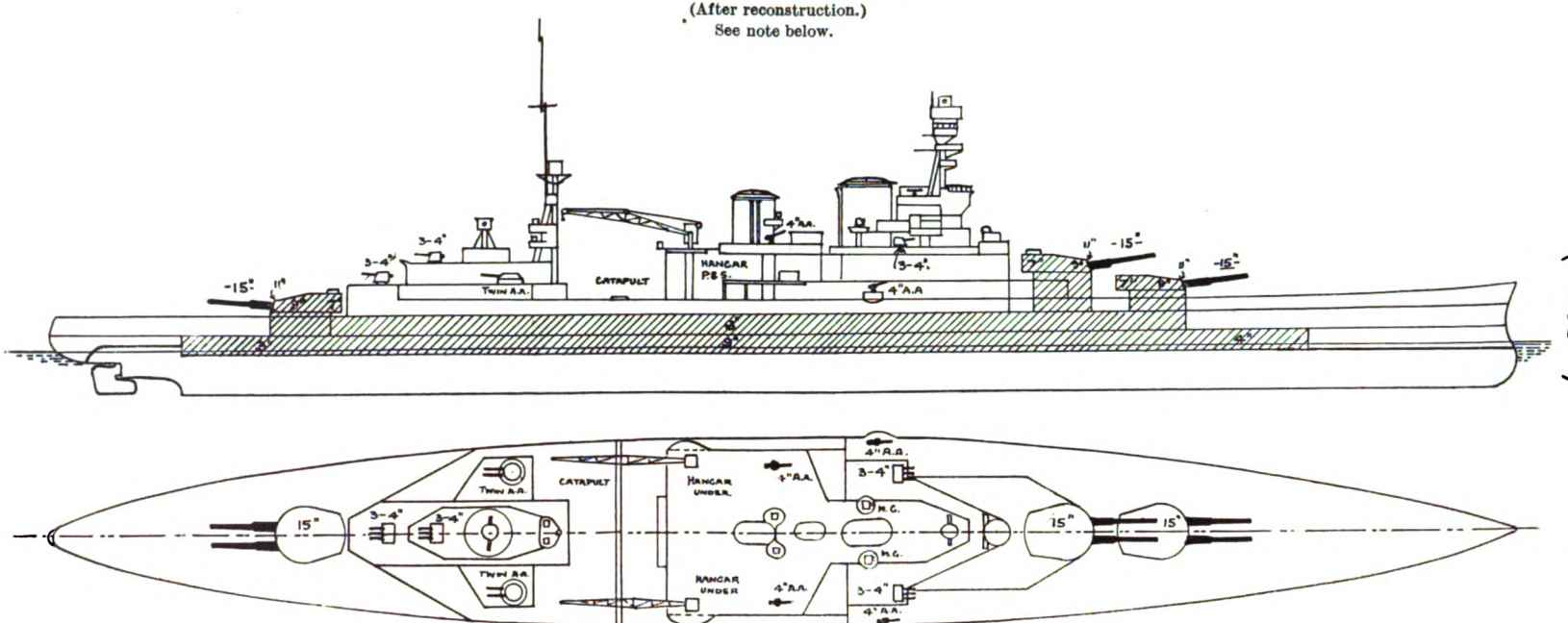
GREAT BRITAIN.

BATTLE-CRUISERS.

Repulse. **Renown.**

(After reconstruction.)

See note below.



Length (extreme), 794 ft. 2 ins.; 32,000 tons; Speed, 31½ knots (without bulges); Completed, 1916.
Repulse was reconstructed 1936. Renown is now in hand for similar modifications, and is in addition being equipped with new engines.
Armament, 6—15-in.; 12—4-in.; 8—4-in. A.A.; 2 twin A.A.; 2 multi machine guns; 1 catapult; 4 aircraft.

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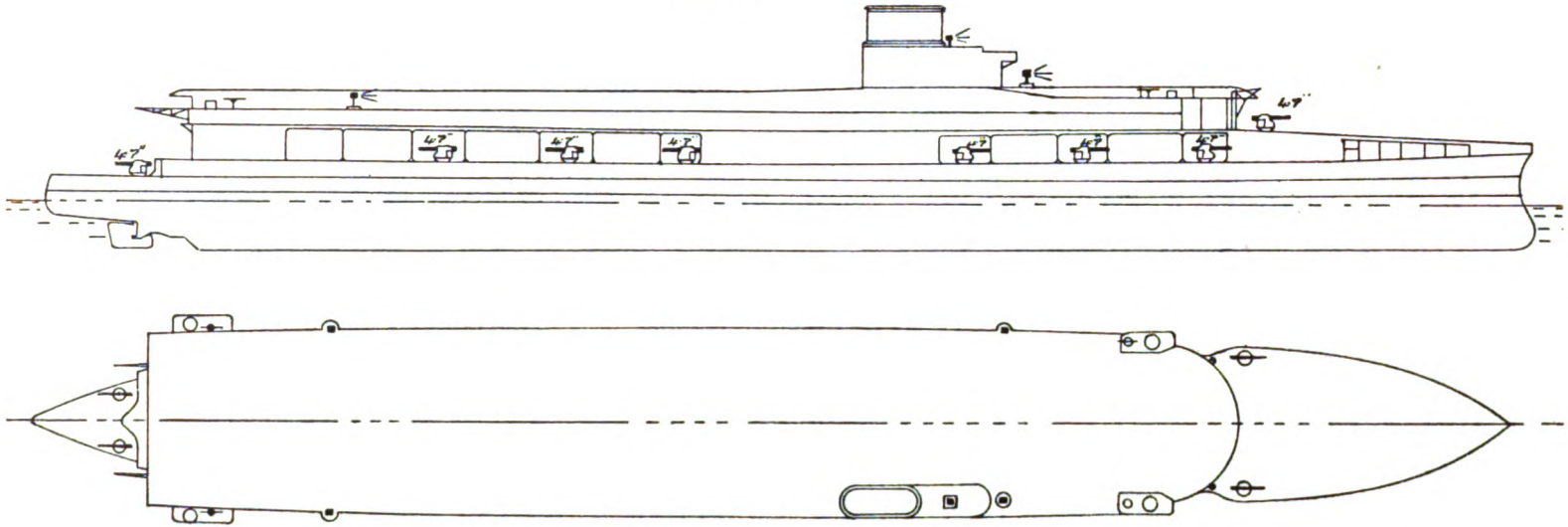
GREAT BRITAIN.

AIRCRAFT CARRIERS.

Courageous. **Glorious.**



Length (extreme), 786 ft. 3 ins. ; 22,500 tons ; Speed, 30½ knots ; Launched as cruisers (1916) ; converted to aircraft carriers (completed 1928 and 1930 respectively).
Armament, 16—4·7-in. ; 4—3-pr. ; 4—2-pr. Pom Poms ; 4 M. ; 42 L.

Corrections to plan.—Flight deck of Glorious has been lengthened and extends aft to the stern. The quarter deck of Glorious has also been raised a deck.

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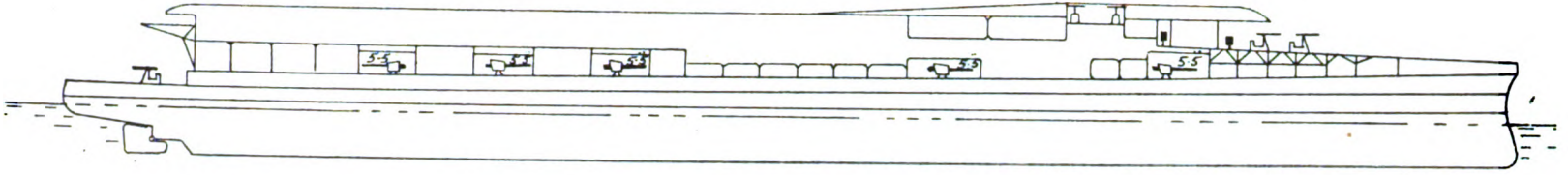
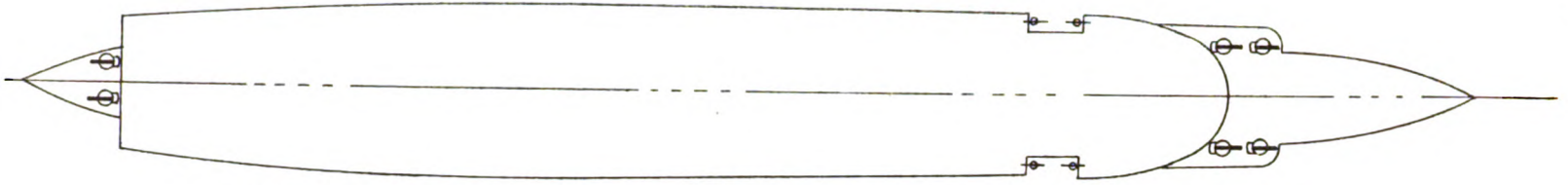
GREAT BRITAIN.

AIRCRAFT CARRIER.

Furious.





Length (extreme), 786 ft. 6 ins.; 22,450 tons; Speed, 31 knots; Completed as a cruiser, 1917; Conversion to aircraft carrier completed 1925.
Armament, 10—5·5-in.; 3—4-in. A.A.; 4—3-pr.; 4—2-pr.; 46 smaller.
NOTE.—Quarter deck has been raised one deck.

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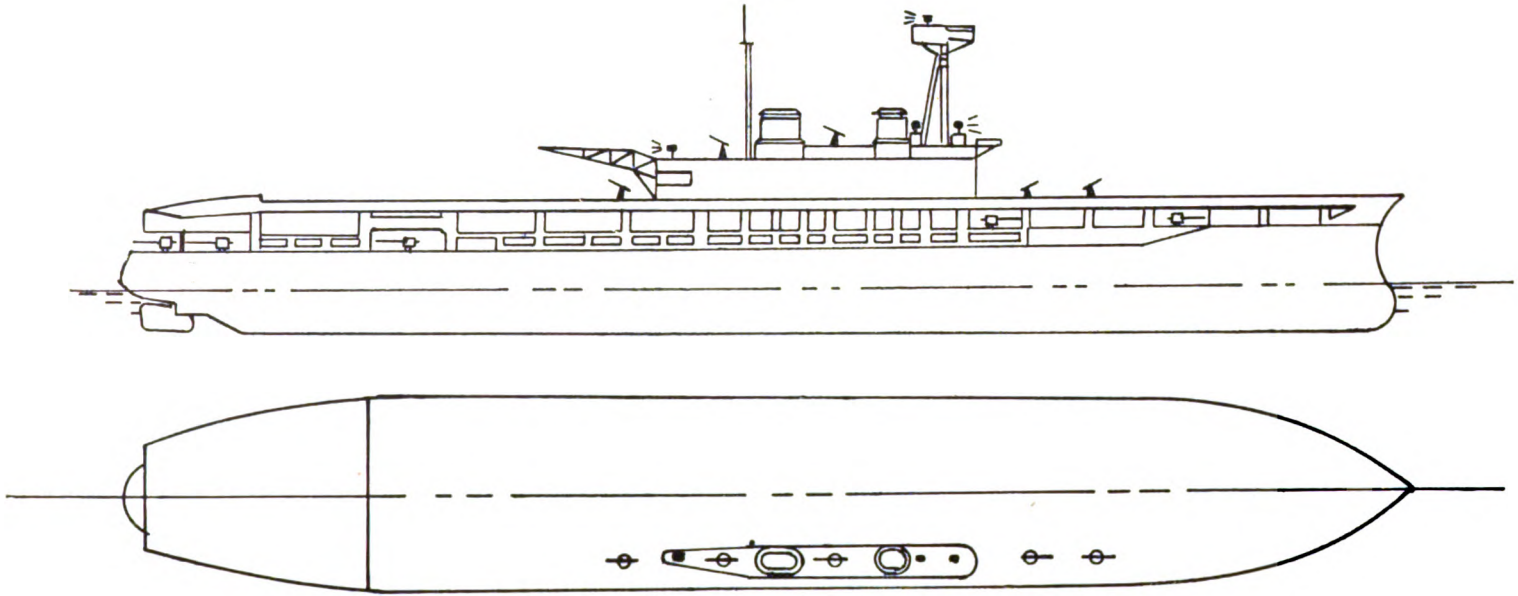
GREAT BRITAIN.

AIRCRAFT CARRIER.

Eagle.



Length (extreme), 667 ft. 6 ins.; 22,600 tons; Speed, 24 knots; Completed as an aircraft carrier, 1924.
Armament, 9—6-in.; 5—4-in. A.A.; 4—3-pr.; 32 smaller.

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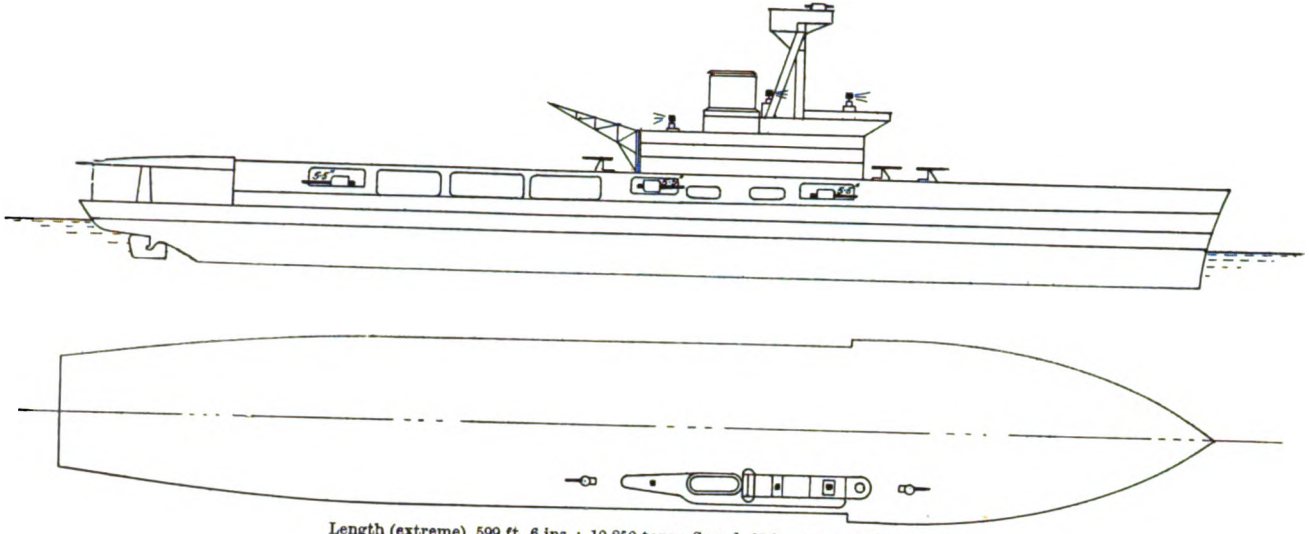
GREAT BRITAIN.

AIRCRAFT CARRIER.

Hermes.



Length (extreme), 599 ft. 6 ins.; 10,850 tons; Speed, 25 knots; Completed 1924.
Armament, 6—5·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 M.; 16 L.

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GREAT BRITAIN.

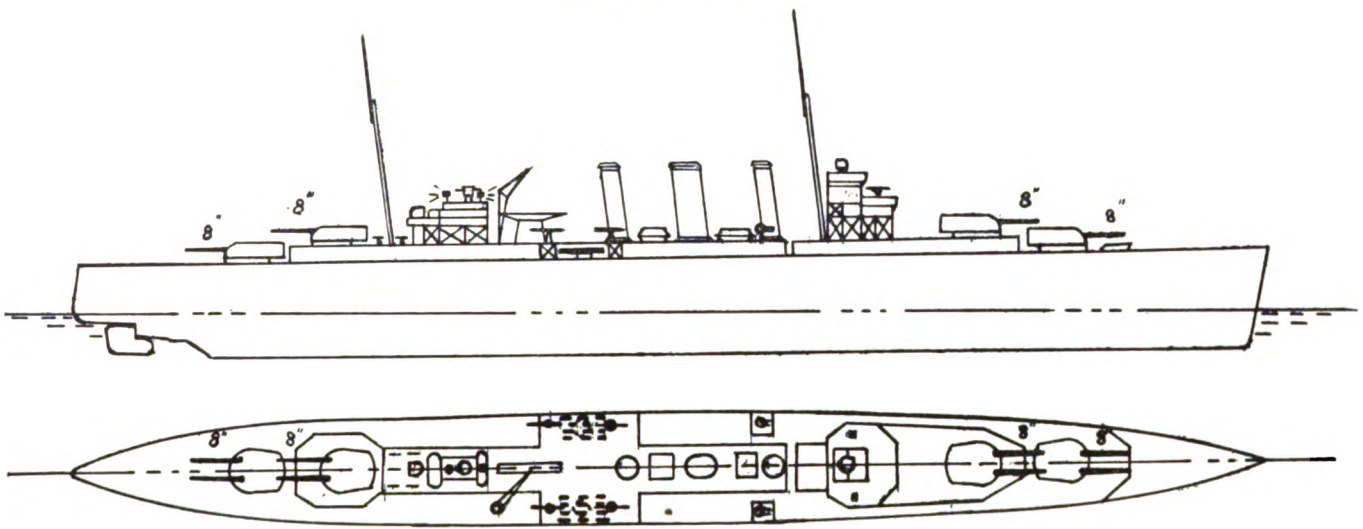
CRUISERS.

'London" Class.

London Sussex. Shropshire. Devonshire.

"Norfolk" Class.

Dorsetshire.* Norfolk.*



Displacements, 9,730—9,900 tons; Length (extreme), 630 ft.; Norfolk and Dorsetshire, 633 ft. Armament, 8—8-in.; 4—4-in. A.A.; 4—3-pr.; 4—2-pr. Pom Poms; 4 M.; 8 L.; 8—21-in. torpedo tubes.

* In Dorsetshire and Norfolk the seaplane crane and the 4—4-in. guns are slightly forward of the positions shown.

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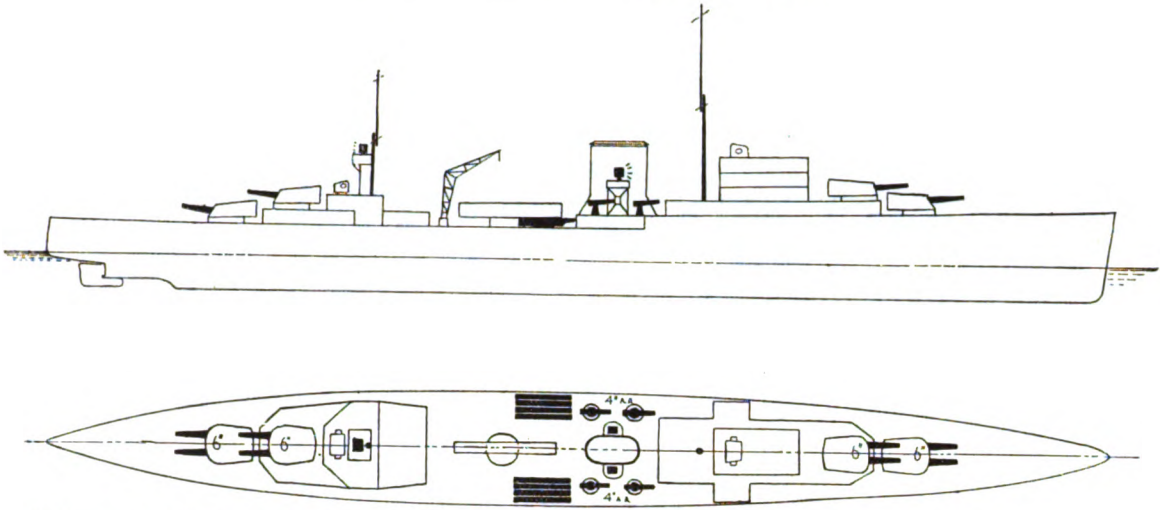
GREAT BRITAIN.

CRUISERS.

"Leander" Class.

Leander. Achilles. Neptune. Orion.



Displacement, 7,000 tons; Length (extreme), 554 ft. 6 ins.; Speed 32½ knots. Armament 8—6-in., 4—4-in. A.A., 4—3-pr., 8 torpedo tubes.
Leander and Achilles, completed 1933. Neptune and Orion, completed 1934.

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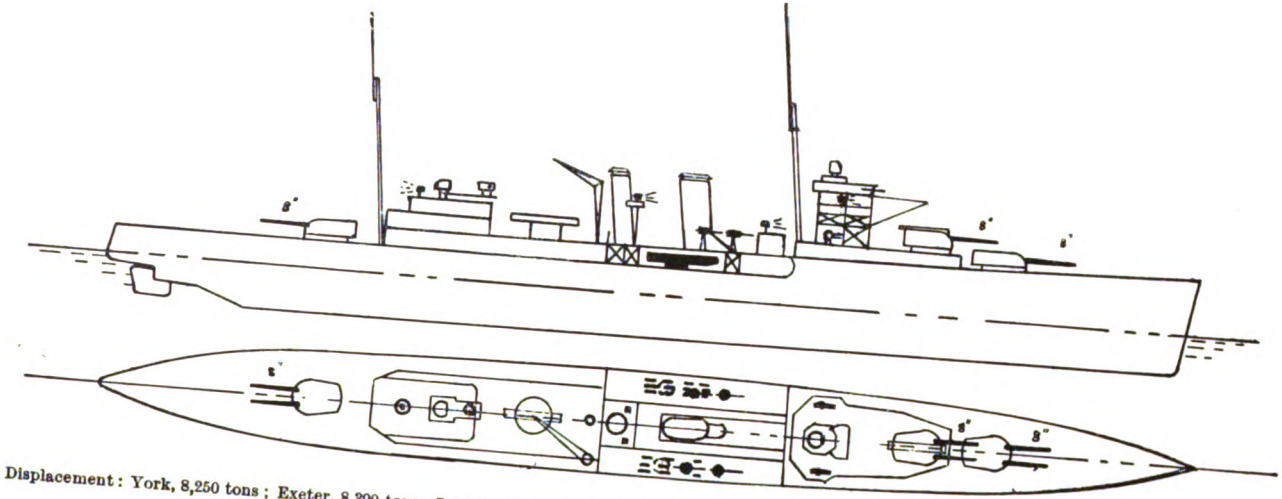
GREAT BRITAIN.

CRUISERS.

"York" Class.

York. Exeter.*



Displacement: York, 8,250 tons; Exeter, 8,390 tons; Length (extreme), 575 ft.; Speed: York, 32¼ knots; Exeter, 32 knots. Armament, 6—8-in.; 4—4-in. A.A.; 4—3-pr.; 2—2-pr.; 4 M.; 8 L.; 6—21-in. torpedo tubes.

* In Exeter funnels and masts are vertical, and the mainmast is taken up through the superstructure.

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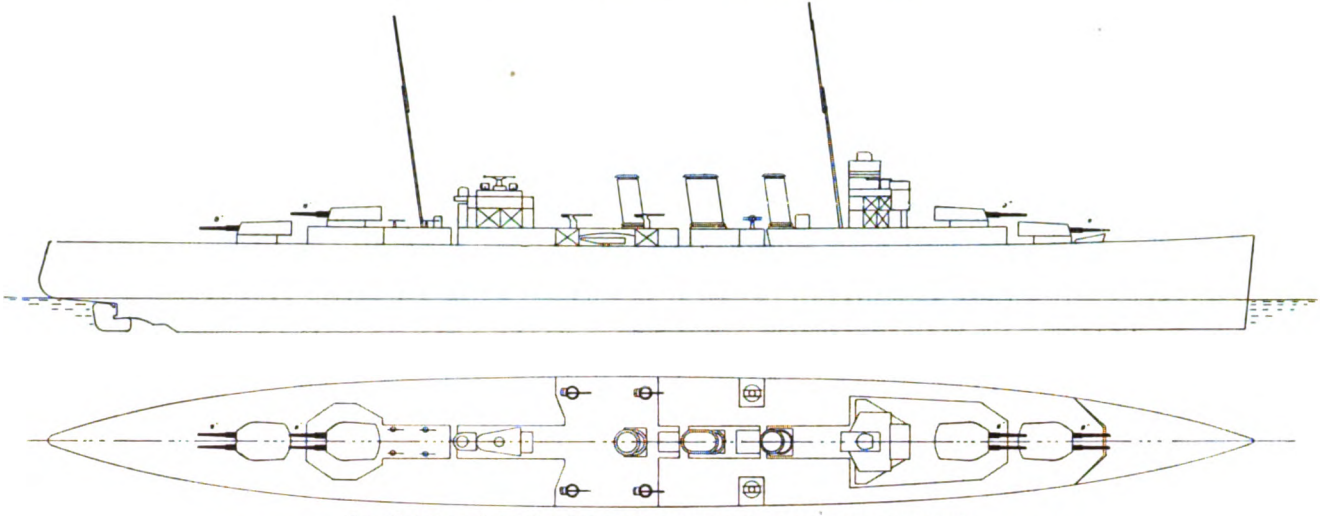
GREAT BRITAIN.

CRUISERS.

"Kent" Class.

Kent. Berwick. Cornwall. Australia.* Canberra.*



Length (extreme), 630 ft.; B.P., 590 ft.; 9,750 to 9,870 tons; Speed, 31¼ knots.
Armament, 8—8-in.; 4—4-in. A.A.; 4—3-pr.; 4—2-pr. Pom Poms; 4 M.; 8 L.; 2 Q.R. 21-in. torpedo tubes.

* H.M. Australian Navy.

NOTE.—The vessels of this class are being modified.

Cumberland and Suffolk were completed 1936—see next page for plans after alterations. Cornwall is in hand.

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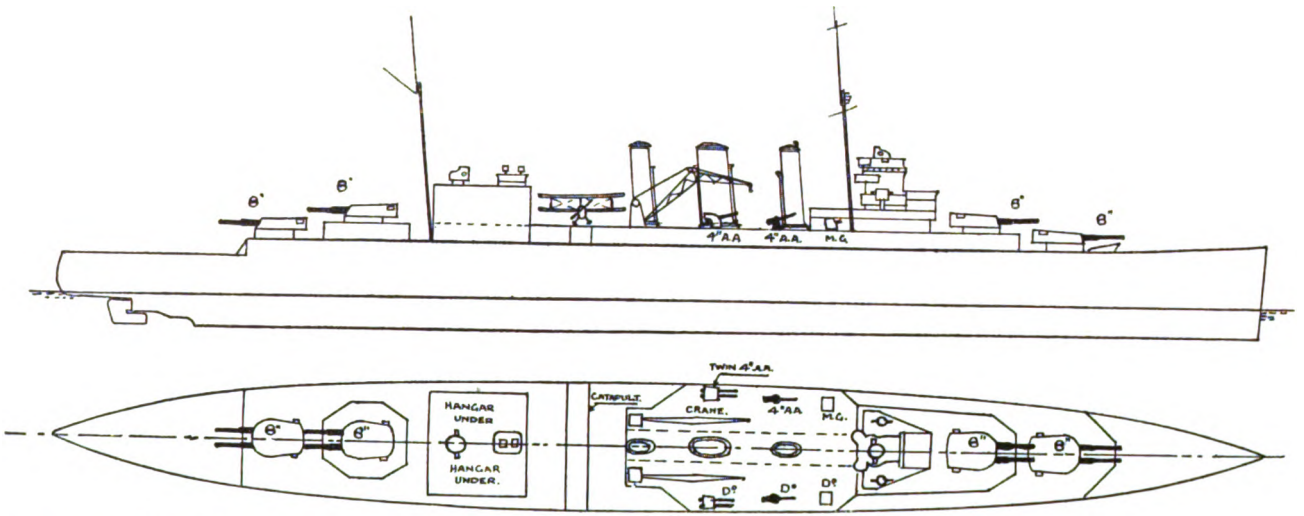
GREAT BRITAIN.

CRUISERS.

Cumberland **Suffolk.**

(As reconstructed 1936.)



Length (extreme), 630 ft.; 10,000 tons; Speed 31½ knots; Completed 1928. Armament 8—8-in.; 6—4-in. A.A.; 2 multi machine guns; 1 catapult; 4 aircraft.

NOTE.—Cornwall is now in hand for similar alterations, and rest of class will be modified in turn.

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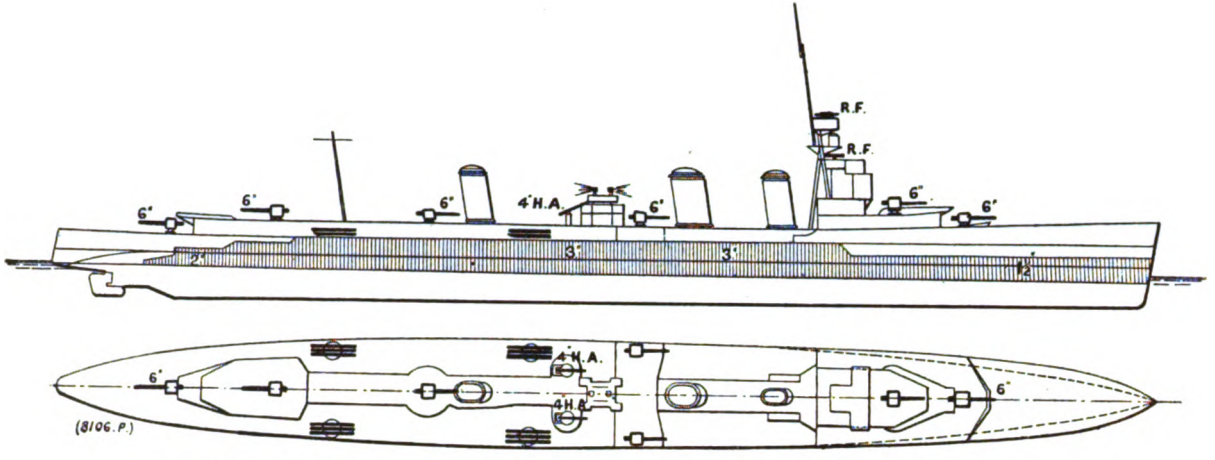
GREAT BRITAIN.

CRUISERS.

"*E*" *Class.*

Emerald. **Enterprise.***



Length (extreme), 570 ft. ; Length B.P., 535 ft. ; Emerald, 7,550 tons ; Enterprise, 7,580 tons ; Speed, 33 knots.
Armament, 7—6-in. ; 3—4-in. A.A. ; 4—3-pr. ; 2—2-pr. Pom Poms ; 2 M. ; 8 L. ; 16—21-in. torpedo tubes.

Correction to plan : The torpedo tubes are in quadruple sets.

* In Enterprise the two forward 6-in. guns are mounted in a twin-mounting on forecastle deck.

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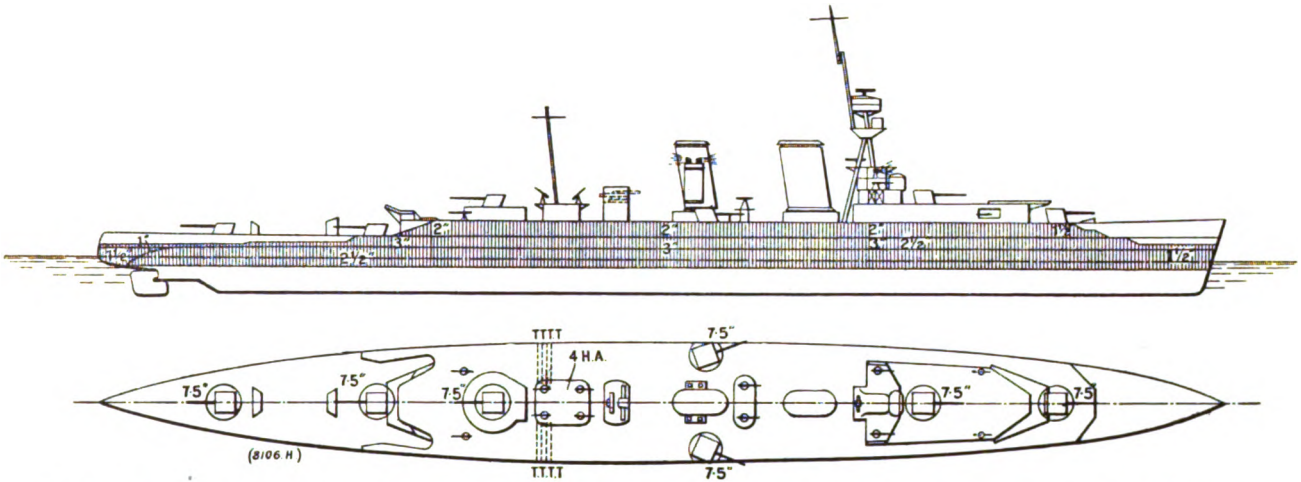
GREAT BRITAIN.

CRUISERS.

Improved "Birmingham" Class.

Effingham. Hawkins. Frobisher. Vindictive.*



Length (extreme), 605 ft.; Length B.P., 565 ft.; 9,770—9,996 tons; Speed: Effingham and Frobisher 30½ knots; Vindictive 30 knots: Hawkins 29½ knots.
Armament: Effingham: 7—7·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 5 torpedo tubes. Frobisher: 6—7·5-in.; 2—4-in. A.A.; 4—3-pr.; 2 M.; 8 L.; 2 torpedo tubes. Hawkins: 7—7·5-in.; 4—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 6 torpedo tubes. Vindictive: 6—7·5-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 2 L.; 6 torpedo tubes.

* Vindictive has an aircraft hangar mounted forward of the bridge, and to accommodate this the raised 7·5-in. gun forward has been removed.

Frobisher is now employed as Cadets' Sea-going Training Ship.

NOTE.—Under the London Naval Treaty the 7·5-in. guns have to be removed. Vindictive is being demilitarised and will be a training ship. The remaining three ships of the class are to be rearmed with 6-in. guns.

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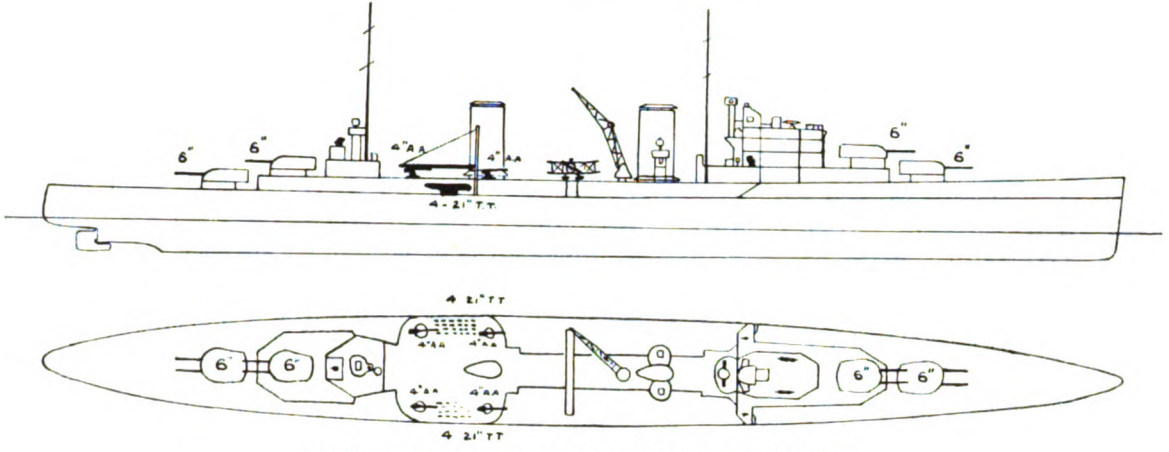
GREAT BRITAIN.

CRUISERS.

"Amphion" Class.

Amphion. Apollo. *Sydney.



Displacement, 7,000 tons; Length (extreme), 560 ft.; Speed, 32½ knots.
Armament, 8—6-in; 4—4-in. A.A.: 21 smaller guns; 4 quadruple 21-in. torpedo tubes; 1 catapult.
Amphion and Apollo carry 2 aircraft and Sydney 1 aircraft. Sydney completed 1935; Amphion and Apollo completed in 1936.

* H.M. Australian Navy.

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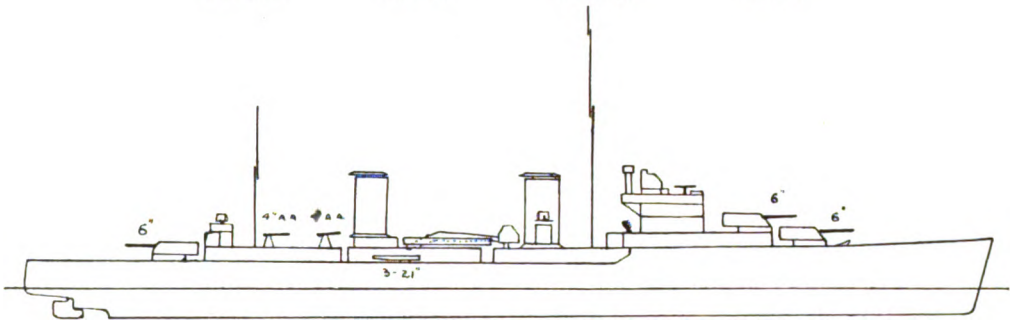
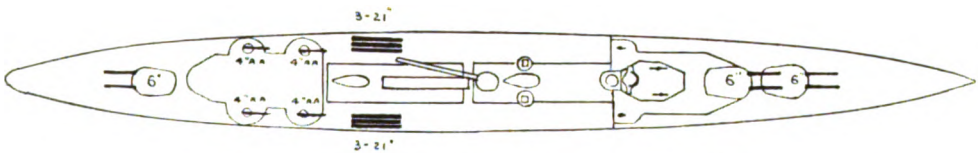
GREAT BRITAIN.

CRUISERS

"Arethusa" Class.

Arethusa. Galatea. Penelope Aurora.





Displacement, 5,200 tons ; Length (extreme), 506 ft. ; Speed, 32¼ knots.
Armament, 6—6-in. ; 4—4-in. A.A. ; 18 smaller ; 2 triple 21-in. torpedo tubes ; 1 catapult, 1 aircraft.

Arethusa and Galatea completed 1935 ; Penelope 1936 ; Aurora building.

Aurora has 4 twin 4-in. A.A. mountings instead of singles.

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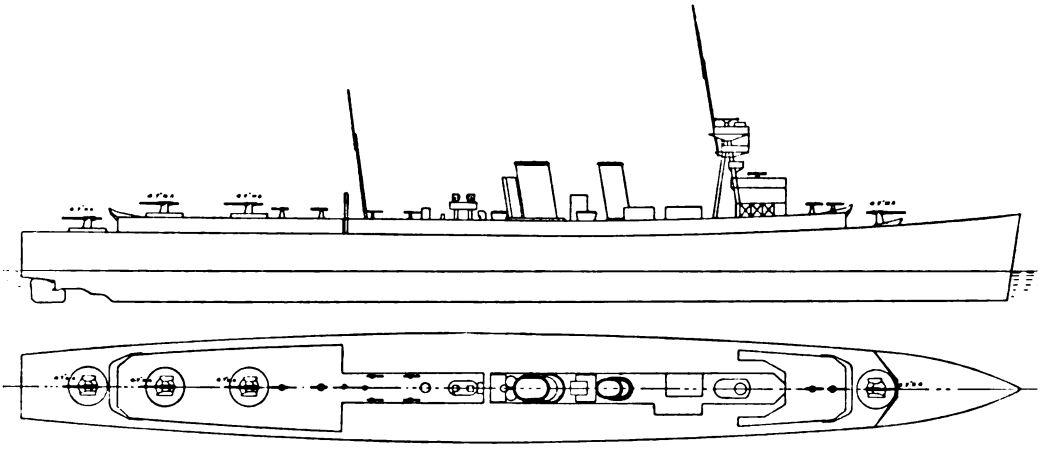
GREAT BRITAIN.

CRUISER MINELAYER.

Adventure.

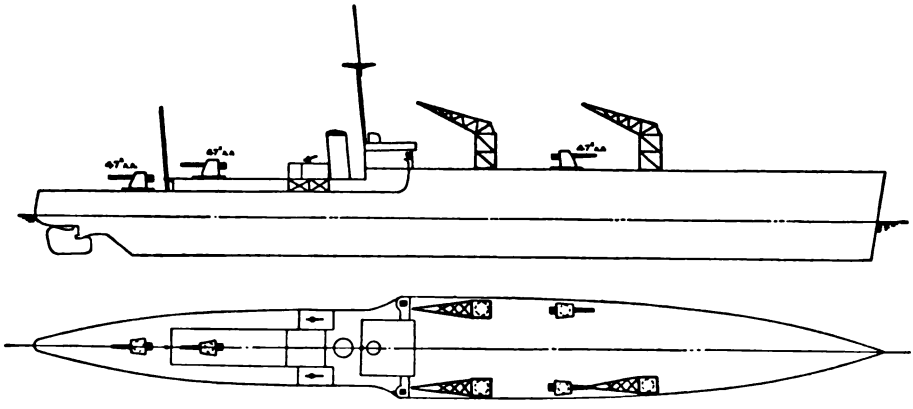


Length (extreme), 539 ft.; Length B.P., 500 ft.; 6,800 tons; Speed, 27¾ knots.
Armament, 4—4·7-in. A.A.; 4—3-pr.; 4—2-pr.; 2 M.; 8 L.; 310 mines.
(Stern has been extended.)

ROYAL AUSTRALIAN NAVY.

SEAPLANE CARRIER.

Albatross.



Length, 443¾ ft.; 4,800 tons; Speed, 21 knots; Completed 1929.
Armament, 4—4·7-in. A.A.; 4—2-pdr. Pom Poms; 4—3-pdr.; 4 M.; 4 L.; 6 seaplanes.

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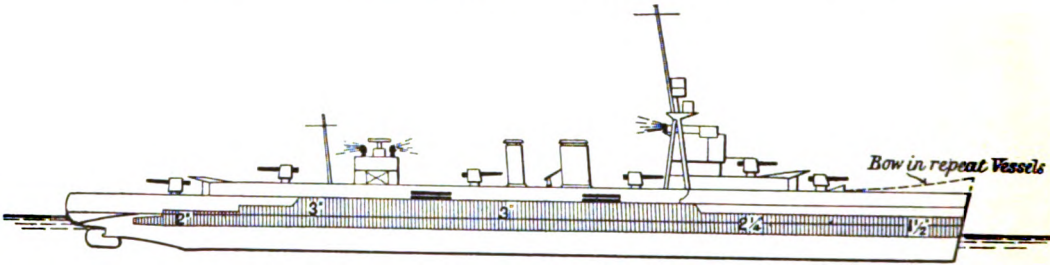
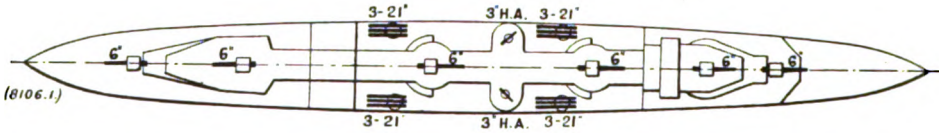
GREAT BRITAIN.

CRUISERS.

"D" Class.

*Despatch. *Diomede. Danae. *Dunedin. Dauntless. *Durban. Dragon *Delhi.





Length, 472¾ ft. ; 4,850 tons ; Speed, 29 knots ;
Armament, 6—6-in. ; 3—4-in. A.A. ; 4—3-pr., 2—2-pr. ; 2 M. ; 8 L. ; 12—21-in. torpedo tubes.

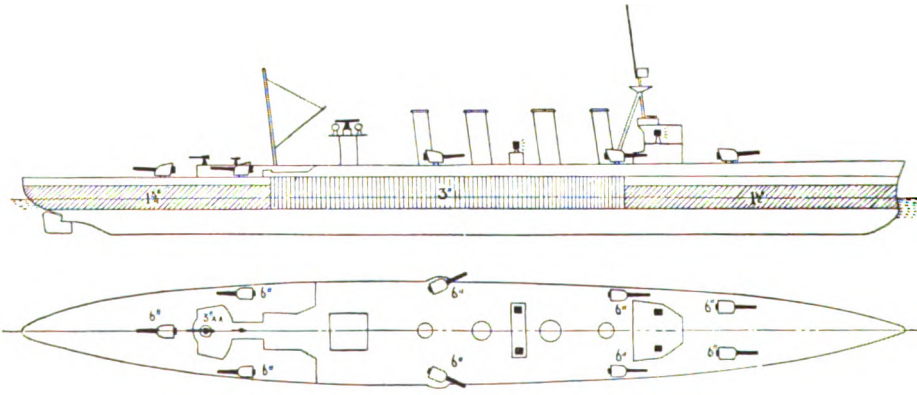
Diomede and Dunedin are attached to the New Zealand Division.

* Repeat vessels.

ROYAL AUSTRALIAN NAVY.

CRUISER.

Adelaide.



Length, 462¼ ft. ; 5,100 tons ; 25 knots.
Armament, 9—6-in. ; 4—3 pr. ; 1—3-in. A.A. ; 2 submerged 21-in. torpedo tubes.

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GREAT BRITAIN.

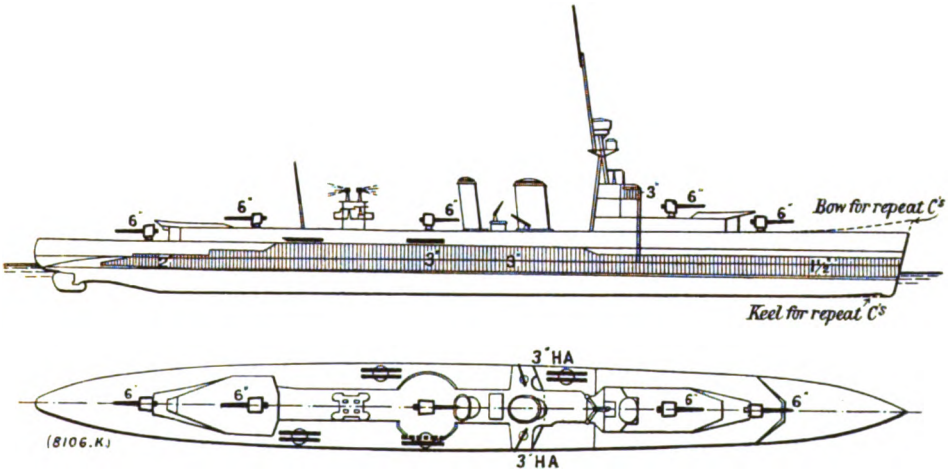
CRUISERS.

"Ceres" Class.

Ceres. Curacoa. Cardiff.

"Carlisle" Class.

*Cairo. *Cape Town. *Carlisle. *Colombo. *Calcutta.



Length (extreme), 450 ft. (451 ft. 9 ins. Repeat Vessels); Length B.P., 425 ft.; 4,290 tons; Repeat vessels, 4,200 tons; Speed, 29 knots; Completed, 1917–18 (Repeat Vessels, 1918–22).

Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 above-water 21-in D.R. torpedo tubes. Cardiff, Curacoa, and Ceres have 2—3-pr.

* Repeat vessels.

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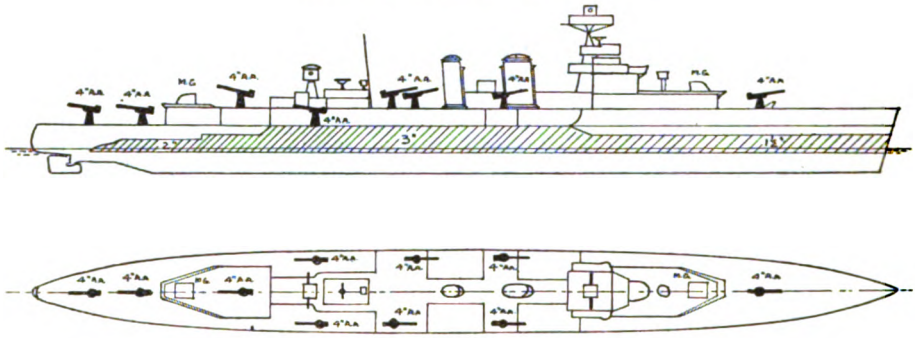
GREAT BRITAIN.

CRUISERS.

"Ceres" Class.

Coventry. **Curlew.**

Rearmed as Anti-Aircraft gun ships 1935.

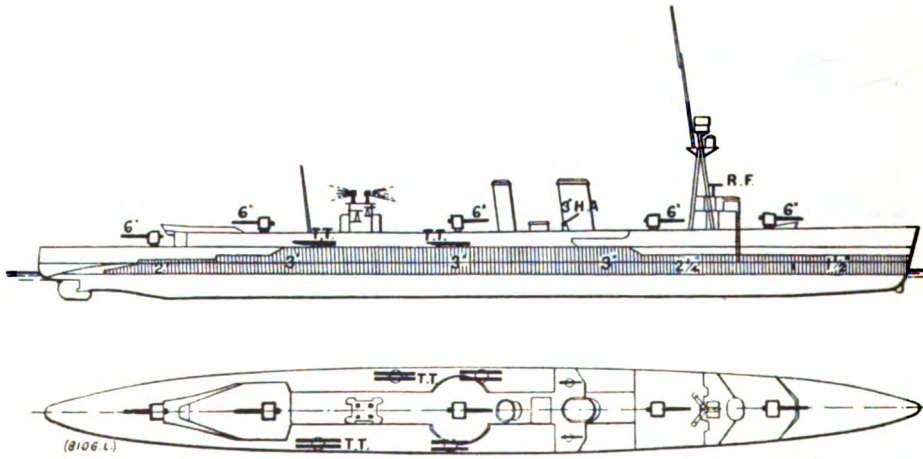


Length (extreme), 450 ft. ; 4,290 tons ; Speed, 29 knots ; Completed 1917.
Armament, 10—4-in. A.A. ; 2—3-pdr. ; 2 multi machine guns.

CRUISERS.

"Caledon" Class.

Caledon. **Calypso.** **Caradoc.**



Caledon, Calypso, Caradoc — Length (extreme), 450 ft. ; Length B.P., 425 ft. ; 4,180 tons ; Speed, 29 knots ; Completed, 1917.
Armament, 5—6-in. ; 2—3-in. A.A. ; 4—3-pr. ; 2—2-pr. Pom Poms ; 2 M. ; 8 L. ; and 4 above-water 21-in. D.R. torpedo tubes.

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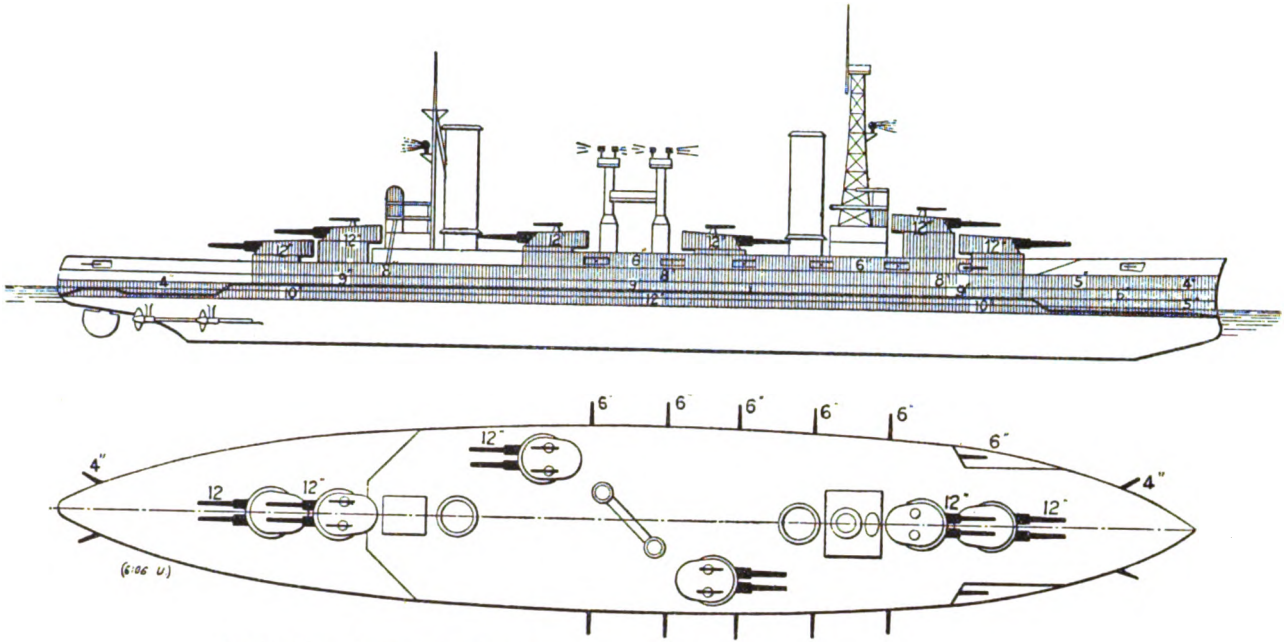
ARGENTINE.

BATTLESHIPS.

Moreno. Rivadavia.



Length (extreme), 585 ft. ; Length on W.L., 575 ft. ; 27,720 tons ; Speed, 22½ knots ; Completed, 1914-15.
Armament, 12—12-in. ; 12—6-in. ; 4—3-pr. ; 6 M. ; 4 L. ; 2 submerged 21-in. torpedo tubes.

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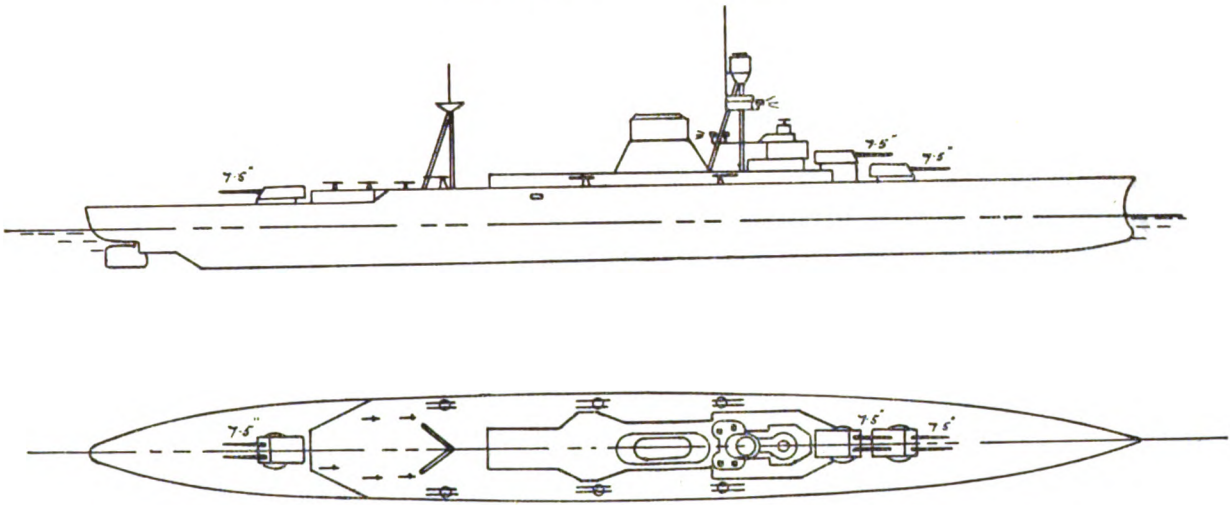
ARGENTINE.

CRUISERS.

Almirante Brown. **25 Maio.**



Length (extreme), 545¾ ft.; 6,495 tons; Speed, 32 knots. Completed 1931.
Armament, 6—7·5-in.; 12—4-in. A.A.; 6 Pom Poms; 6 21-in. torpedo tubes.
1 catapult; 2 seaplanes.

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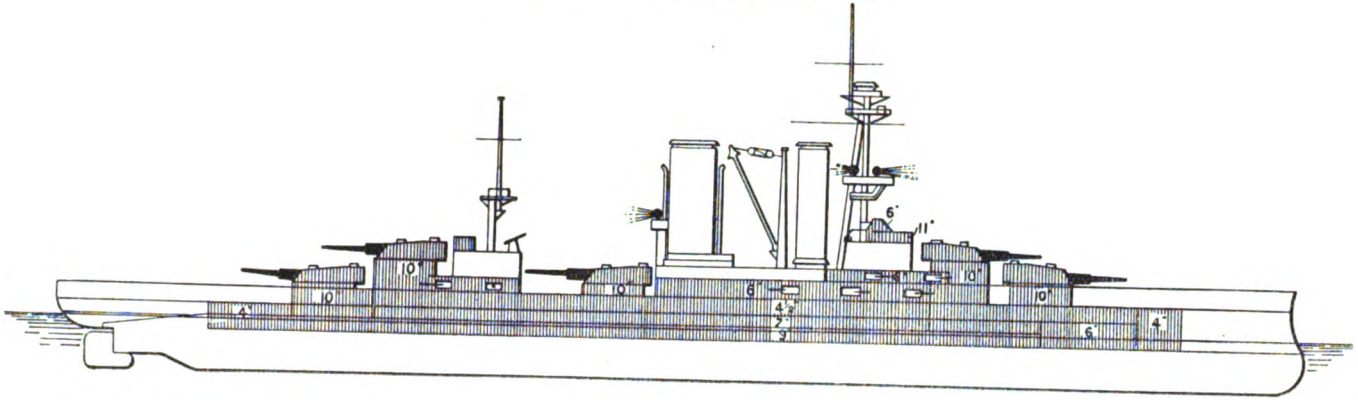
CHILE.

BATTLESHIP.

Almirante Latorre (*formerly* **H.M.S. Canada**).



Length (extreme), 661 ft. ; Length B.P., 625 ft. ; 33,200 tons ; Speed, 23 knots ; Completed, 1915 ; Modernised at Devonport Dockyard 1929–31.*
Armament, 10—14-in. ; 14—6-in. ; 2—3-in. A.A. ; 4—3-pr. ; 4 submerged 21-in. torpedo tubes.

* During modernisation maintopmast has been raised and bridge platforms extended.

Four 4-in. A.A. have been added.

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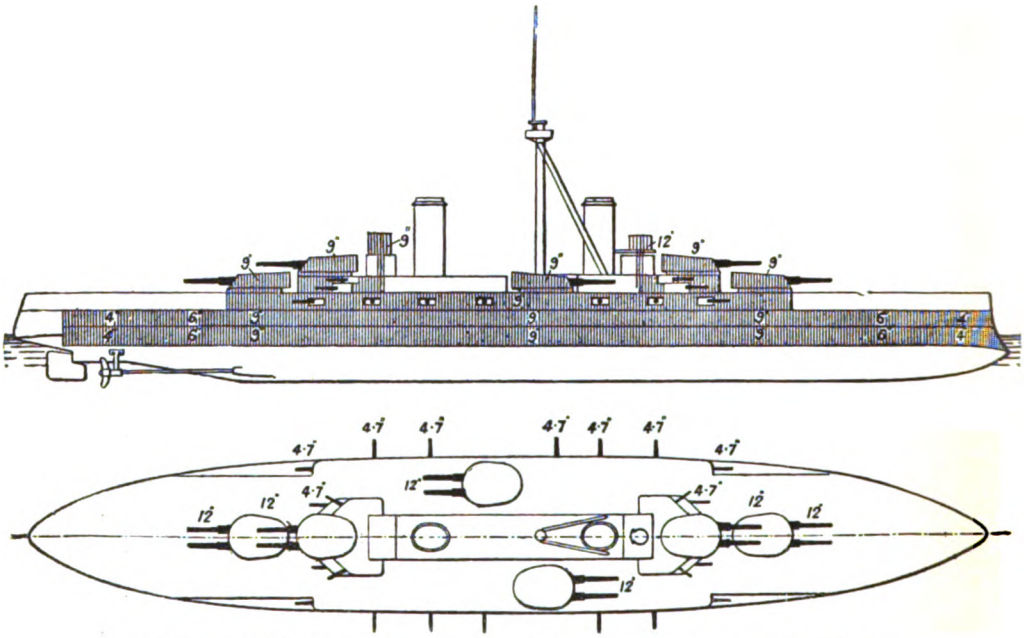
BRAZIL.

BATTLESHIPS.

Minas Geraes. **São Paulo.**

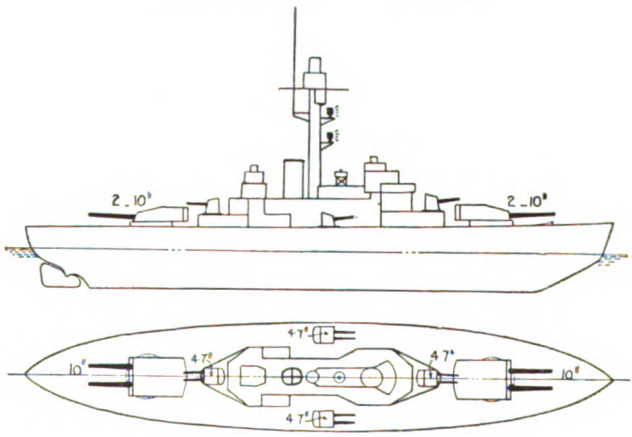


Length (extreme), 543 ft.; Length B.P., 500 ft.; 19,200 tons; Speed, 21 knots; Completed, 1909, 1910.
Armament, 12—12-in.; 12—4·7-in.; 6—3-pr.; 2—3-in A.A.; 4 M.
Overhauled and refitted at Brooklyn Navy Yard, 1921-22, and A.A. guns installed.
Correction to plan: Ten main deck 4·7-in. guns removed in 1931.

FINLAND.

ARMOURED GUNBOATS.

Väinämöinen. **Ilmarinen.**



Length, 305 ft.; 4,000 tons; Speed, 15 knots.
Armament, 4—10-in.; 8—4·7-in.
Completed, 1932—33.

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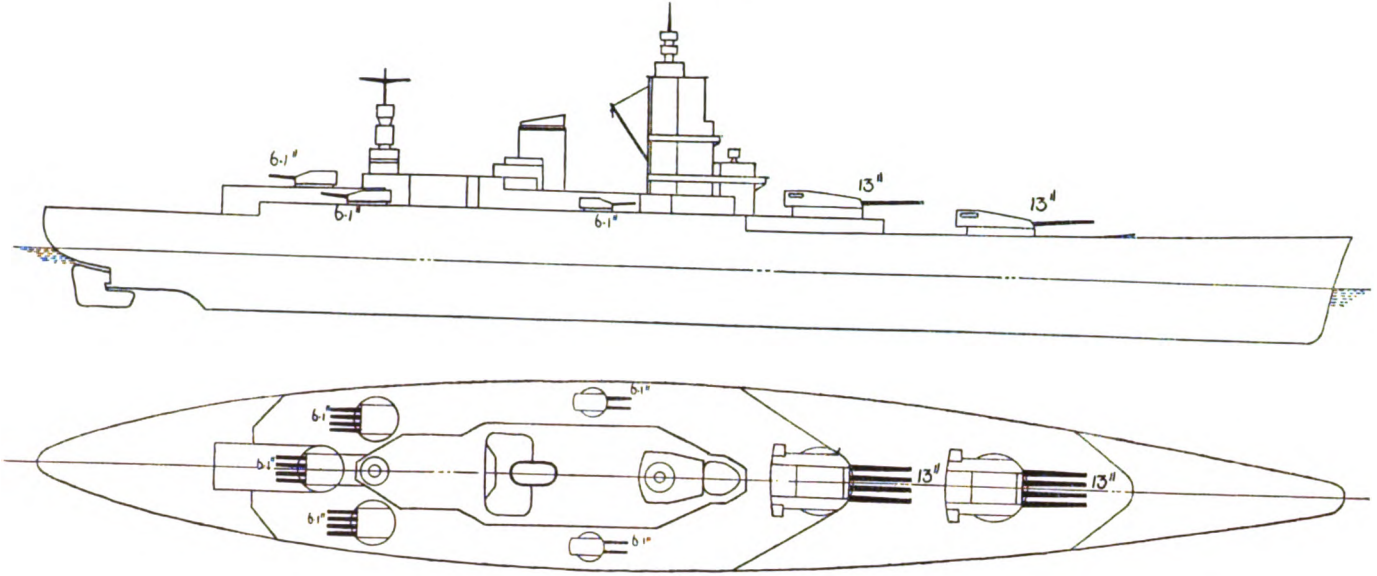
FRANCE.

BATTLESHIP.

Dunkerque.



Length, 706 ft.; 26,500 tons; Speed, about 29 knots.
Armament, 8—13-in. 16—5·2-in., 40 smaller.
Building at Brest.

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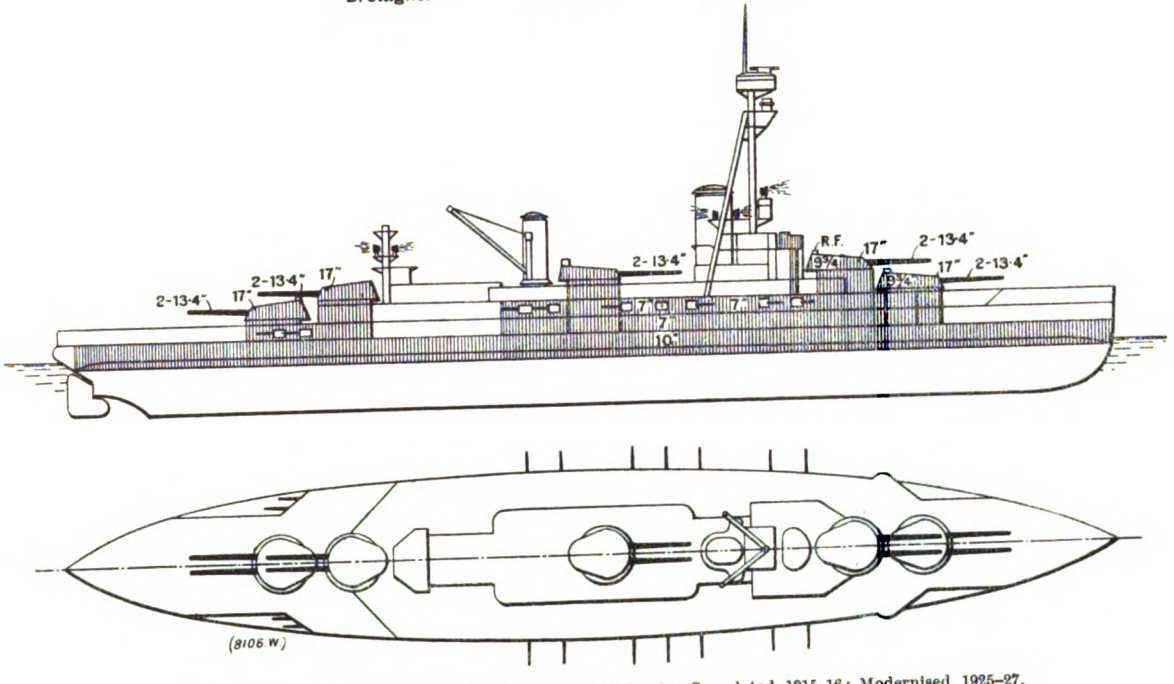
FRANCE.

BATTLESHIPS.

Bretagne. Lorraine. Provence.



Length (extreme), 544 ft. 6 ins.; 22,189 tons; Speed, 20 knots; Completed, 1915–16; Modernised, 1925–27. Converted to oil burning, 1931.

Armament, 10—13·4-in.; 18—5·5-in.; 4—3-in. A.A.; 4—3 pr.; 2—1-pr.; 4 submerged 18-in. torpedo tubes.

Correction to plan: The ships have now tall maintopmasts and no foretopmasts.

NOTE.—Lorraine has been reconstructed. The midships turret has been removed and a hanger fitted in its place. Machinery is being modernised and speed increased. Improved protection is being fitted.

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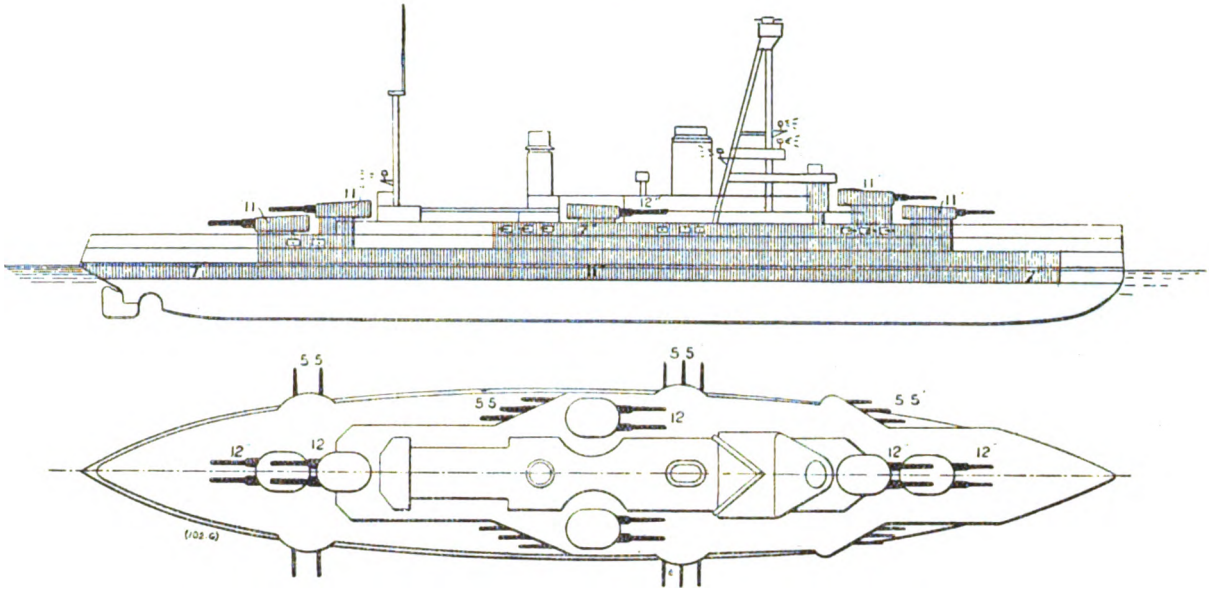
FRANCE.

BATTLESHIPS.

Jean Bart. Courbet. Paris.



Length (extreme), 544 ft. 6 ins.; Length B.P., 541 ft. 4 ins.; 22,189 tons; Speed, 20 knots; Completed, 1913–14. Modernised in 1929. Converted to oil burning, 1931.

Armament, 12—12-in.; 22—5·5-in.; 4—3-in. A.A.; 4—3-pr. (Courbet has 3—3-pr.); 2—1-pr.; 4 submerged 18-in. torpedo tubes.

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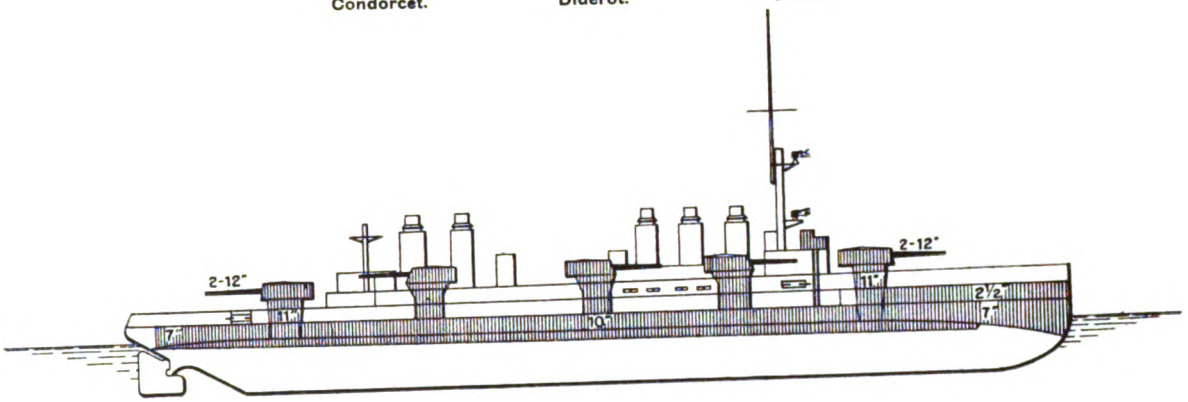
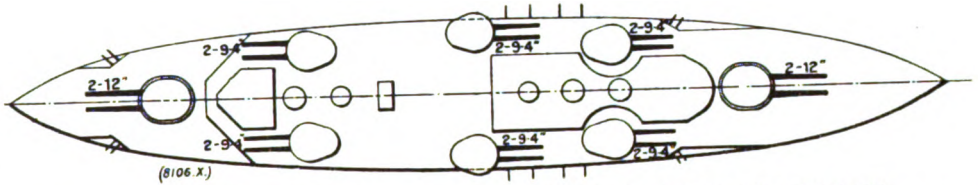
FRANCE.

BATTLESHIPS.

Condorcet. Diderot. Voltaire.





Length (extreme), 481 ft.; Length W.L., 475 ft. 9 ins.; Speed, 19¼ knots; 17,597 tons; Completed, 1911.
Armament, 4—12-in.; 12—9·4-in.; 12—3-in.; 2—3-in. A.A.; 2—3-pr. A.A. (Condorcet, 4—3-pr.); 2—1-pr.; 2 L.; 2 submerged 18-in. torpedo tubes.
Correction to plan: Diderot has tall mainmast.

These vessels are to be scrapped.

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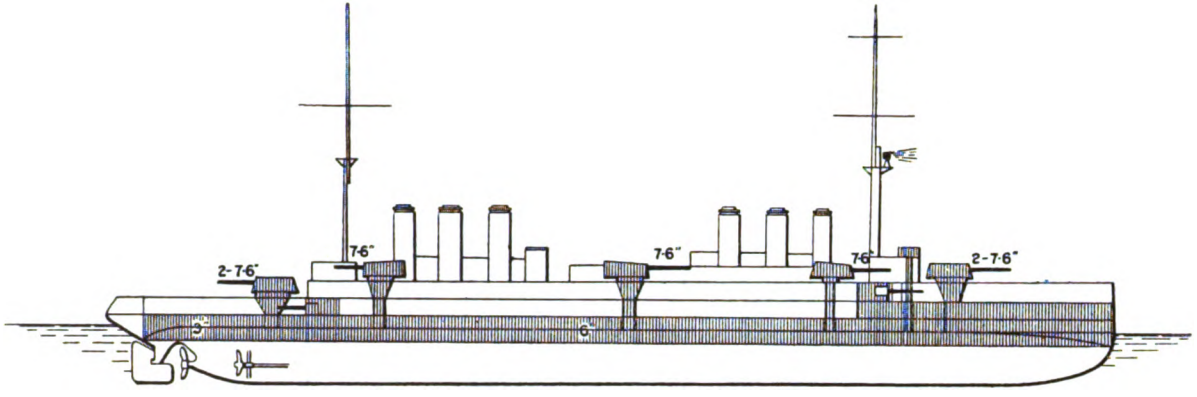
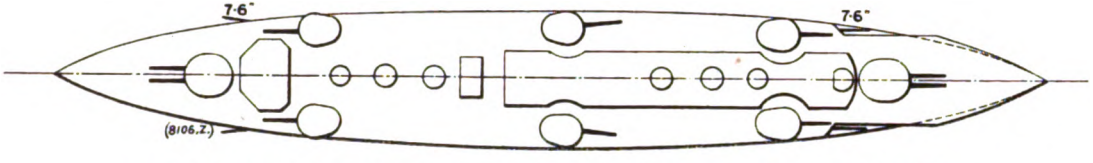
FRANCE.

ARMOURED CRUISER.

Waldeck Rousseau.





Length (extreme), 521 ft. 4 ins.; Length W.L., 515 ft.; Speed, 23 knots; 12,617 tons; Completed, 1910.
Armament, 14—7·6-in.; 10—3-in.; 10—9-pr. A.A.; 2—3 pr.; 2 M.; 2 submerged 18-in. torpedo tubes.

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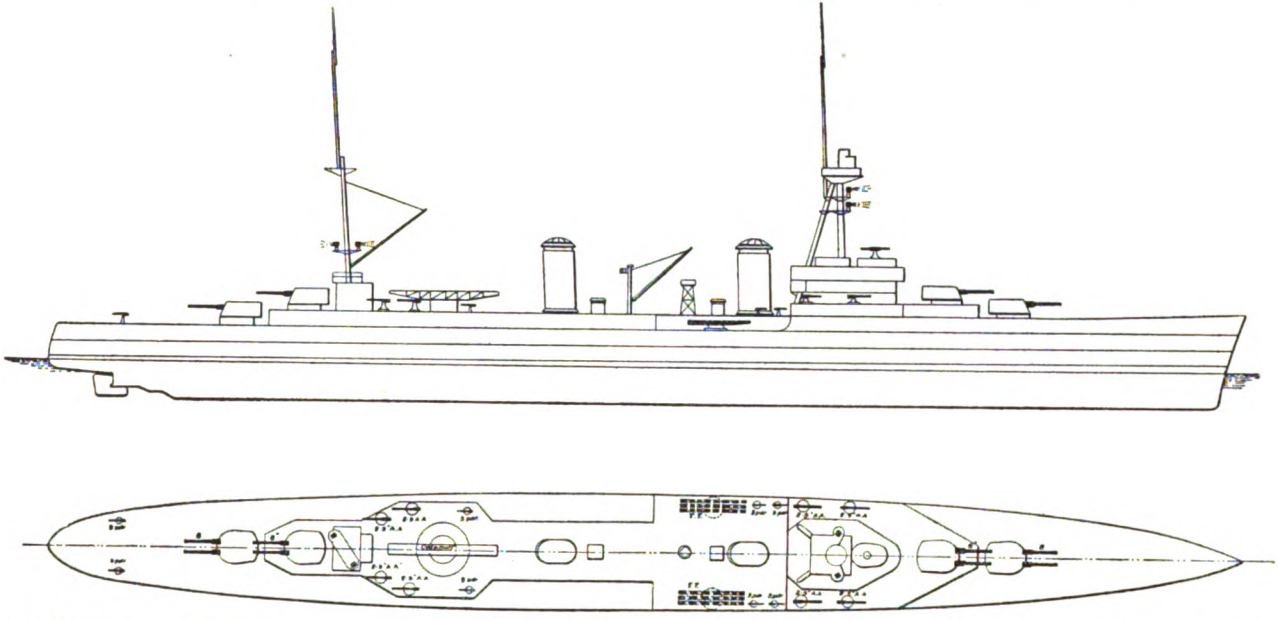
FRANCE.

CRUISERS.

Duquesne. Tourville. (" *Duquesne" Class.*) Suffren. Colbert. Foch. Dupleix. (" *Suffren" Class.*



Length (between perpendiculars), 607 ft. (Duquesne and Tourville (extreme), 626 ft. 8 in.); 10,000 tons; Speed, 32 knots (Duquesne and Tourville, 33·2 knots).
Armament, 8—8-in., 8—3-in. A.A. (Dupleix, Colbert and Foch have 8—3·5-in. A.A.); 8—1-pr.; 2—triple 21-in. T.T.'s.

The above plan is for Duquesne and Tourville. The others differ slightly from this in details of bridges, cranes, catapults, etc. Suffren has 2 catapults in the position shown above. Colbert, Dupleix and Foch have tripod mainmasts, 2 catapults between the funnels and the two cranes abreast the after funnel.

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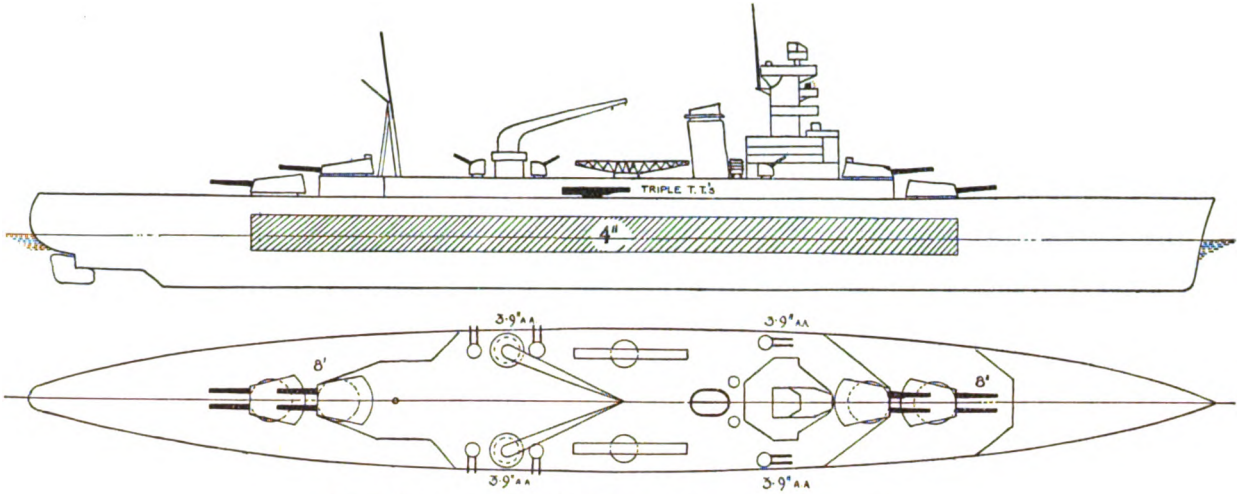
FRANCE.

CRUISER.

Algérie.



Length (between perpendiculars), 607 ft.; 10,000 tons; Speed, 31 knots.
Armament, 8—8-in.; 12—3·9-in. A.A.; 8—1·5-in.; 16 M.
2 catapults; 2 seaplanes.

Correction to plan: The aircraft cranes are not sided as shown, but lie fore and aft from a structure on the middle line between funnel and mainmast.

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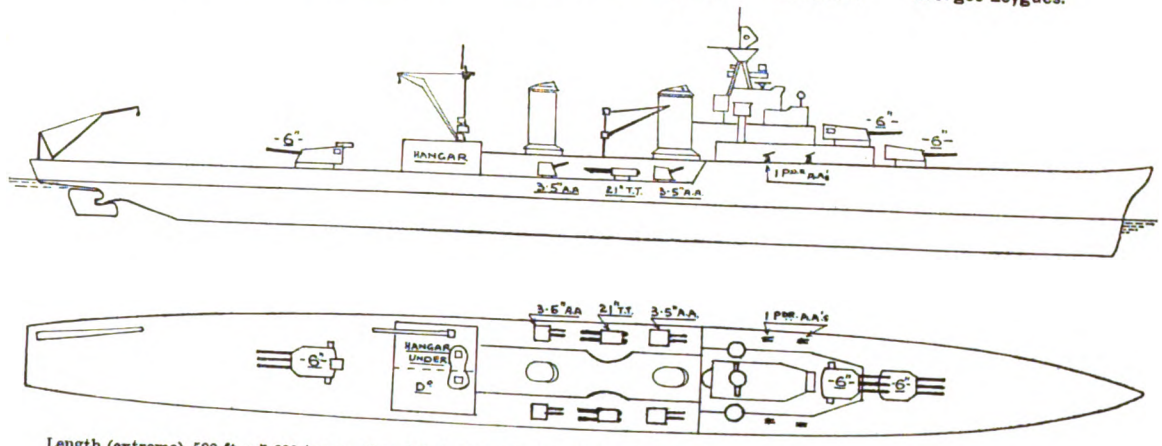
FRANCE.

CRUISERS.

Jean-de-Vienne. La Galissonnière. Marseillaise. Gloire. Montcalm. Georges Leygues.



Length (extreme), 590 ft.; 7,600 tons; Completed, 1935–37; Speed, Jean-de-Vienne and La Galissonnière 31 knots, others 32½ knots.
Armament, 9—6-in.; 8—3·5-in A.A.; 8—1-pdr. A.A.; 4—21-in. torpedo tubes; 2 seaplanes.
Fitted with Hein landing canvas at the stern.

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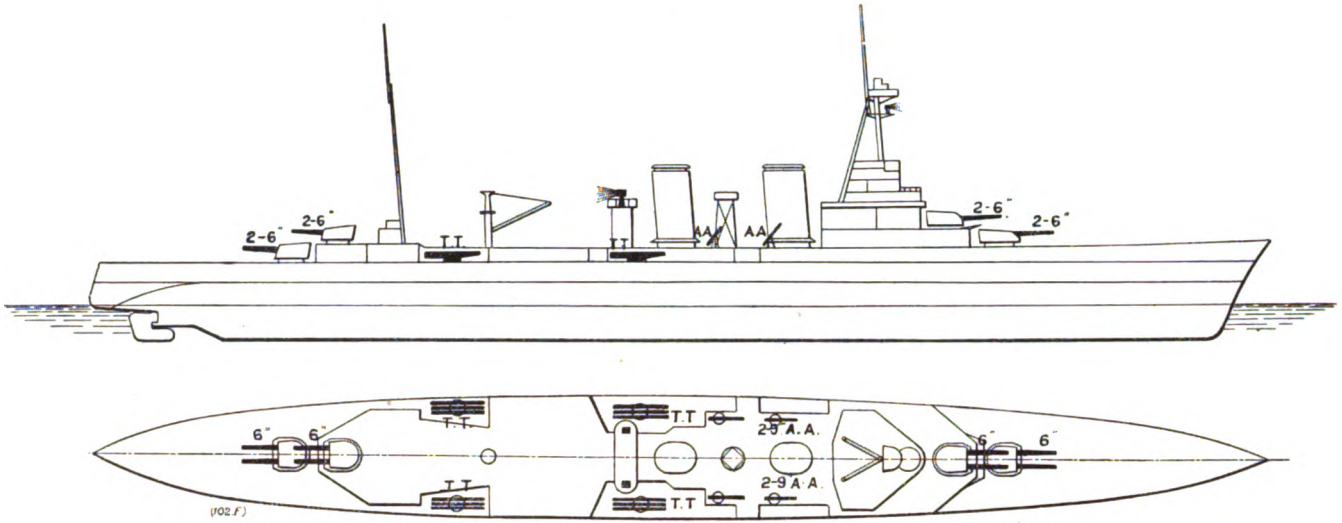
FRANCE.

CRUISERS.

"Duguay-Trouin" Class.

La Motte Picquet. Duguay-Trouin. Primauguet.



Length (extreme), 594 ft. 10 ins.; Length B.P., 575 ft.; 7,249 tons; Speed, 33 knots. Completed, 1926–27.
Armament, 8—6·1-in.; 4—3-in. A.A.; 2—3-pr.; 2 M.; 1 L.; 4 triple torpedo tubes (21·7-in. torpedoes); catapult; 2 seaplanes.

NOTE.—Reported to have protection to magazines.

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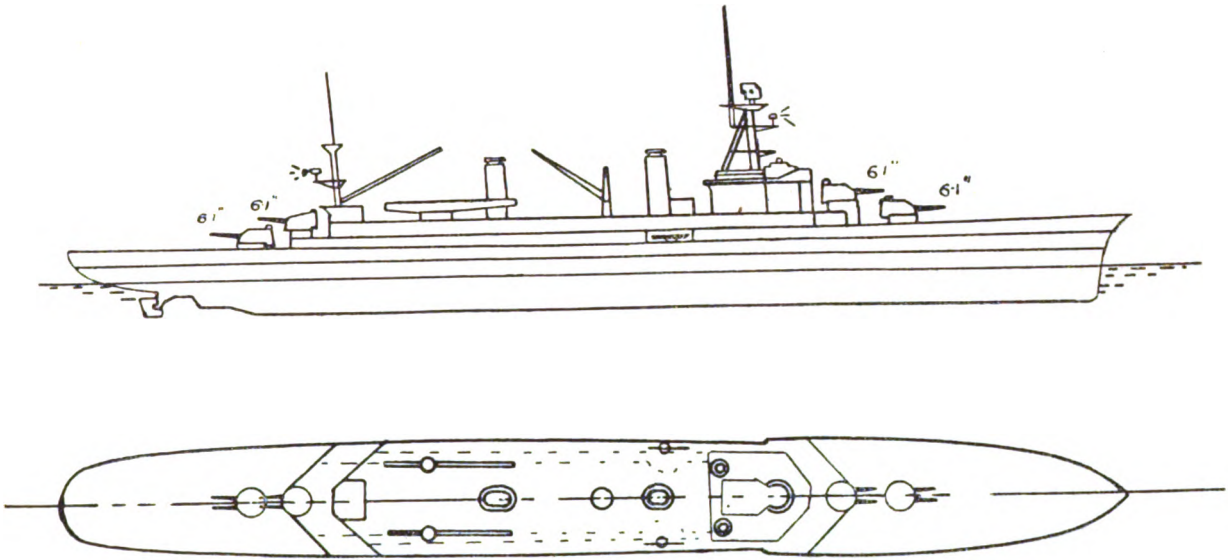
FRANCE.

TRAINING CRUISER.

Jeanne d'Arc.



Length (extreme), 557 ft. 8 ins.; 6,496 tons; Speed, 26 knots; Completed 1931.

Armament, 8—6·1-in.; 4—3-in. A.A.; 2—1·6-in.; 2 M.; 2—21·7-in. torpedo tubes.
2 seaplanes.

Correction to plan: The catapults have been removed.

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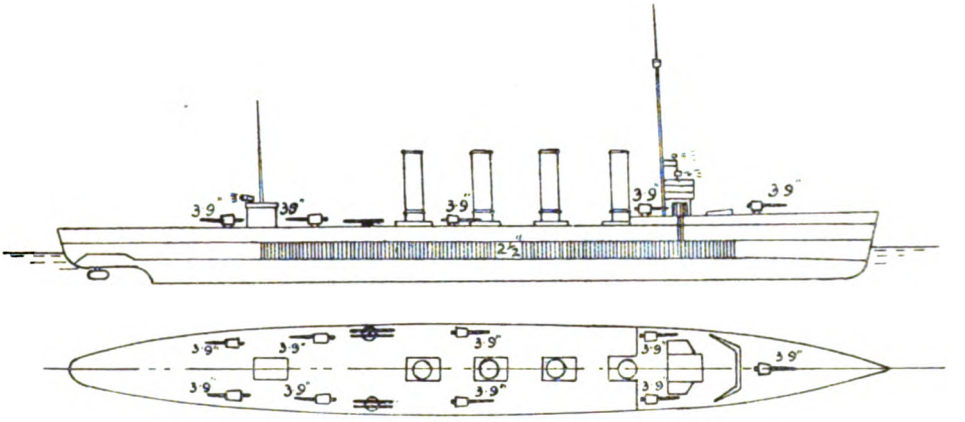
FRANCE

LIGHT CRUISER.

Thionville (*ex-Austrian* Novara).

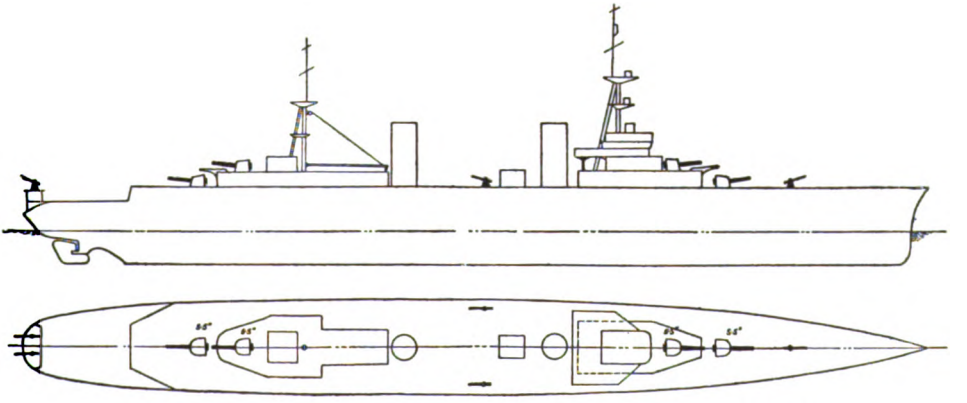


Length (extreme), 428 ft. 7 ins. ; 2,922 tons ; Speed, 27 knots.
Armament, 9—3·9-in. ; 2—3-in. A.A. ; 2 twin above-water torpedo tubes.
Correction to plan : The torpedo tubes are fitted right aft.

FRANCE.

CRUISER MINELAYER.

Pluton.



Length (between perpendiculars), 472 ft. ; 4,773 tons ; Speed, 30 knots ; Completed, 1931.
Armament : 4—5·5-in. , 10—1-pdr. ; 12 M. ; 1,000 mines.

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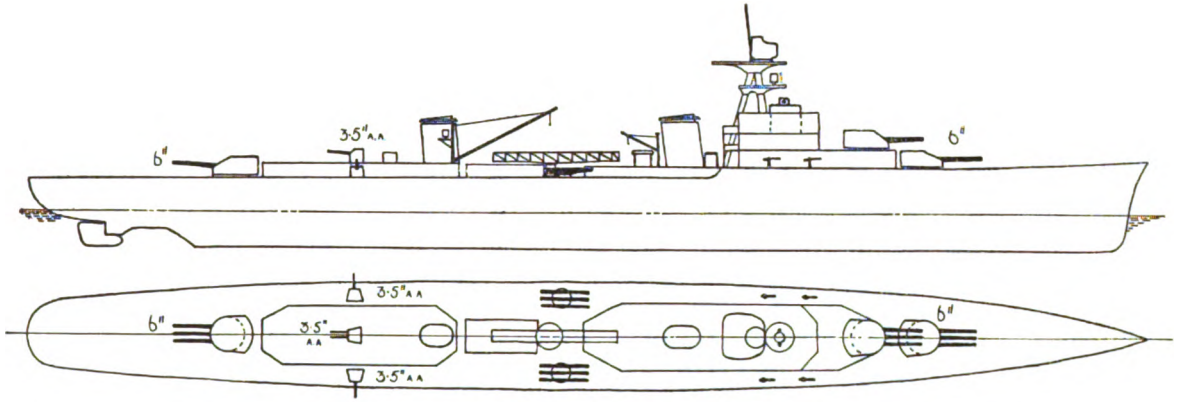
FRANCE.

CRUISER MINELAYER.

Emilé Bertin.



Length (extreme), 580 ft. ; 5,886 tons ; Speed, 34 knots.
Armament, 9—6-in. ; 4—3·5-in. A.A. ; 8—1-pr. ; 250 mines.
1 catapult ; 1 aircraft.

Building at Penhoet, St. Nazaire.

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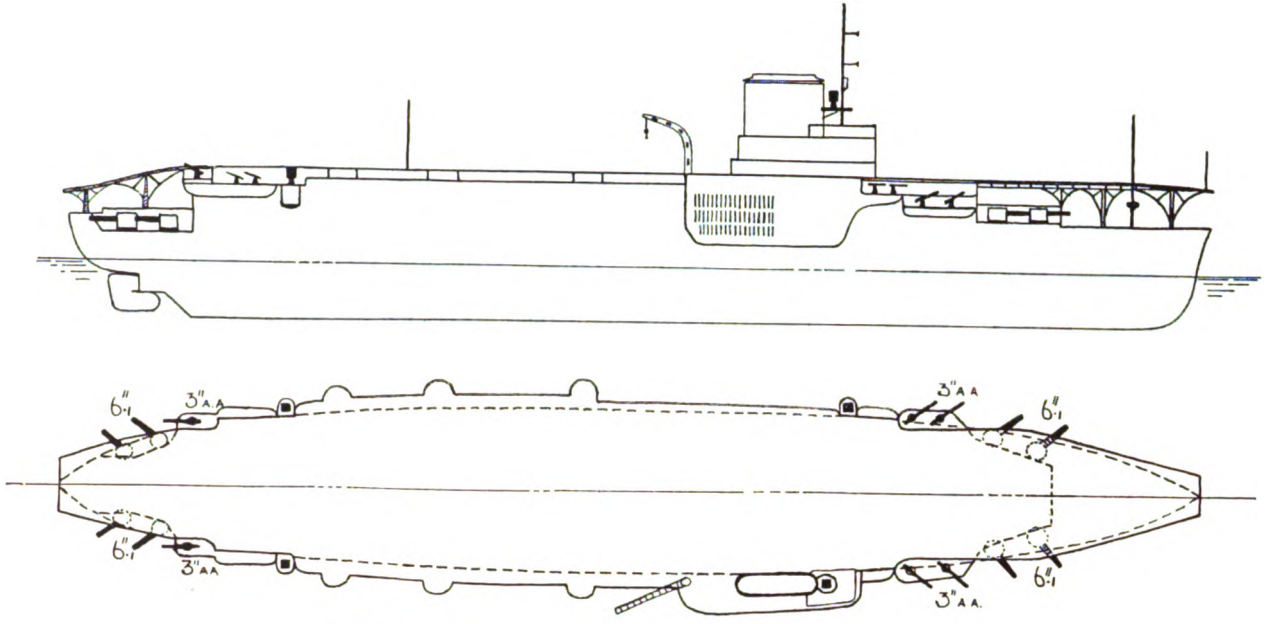
FRANCE.

AIRCRAFT CARRIER.

Béarn.



Length (extreme), 597 ft. ; 22,146 tons ; Speed, 21·5 knots ; Completed, 1928.
Armament, 8—6·1-in. ; 6—3-in. A.A. ; 8—1-pr. A.A. ; 12 M. A.A. ; 4—21·7-in. torpedo tubes ; 41 planes.

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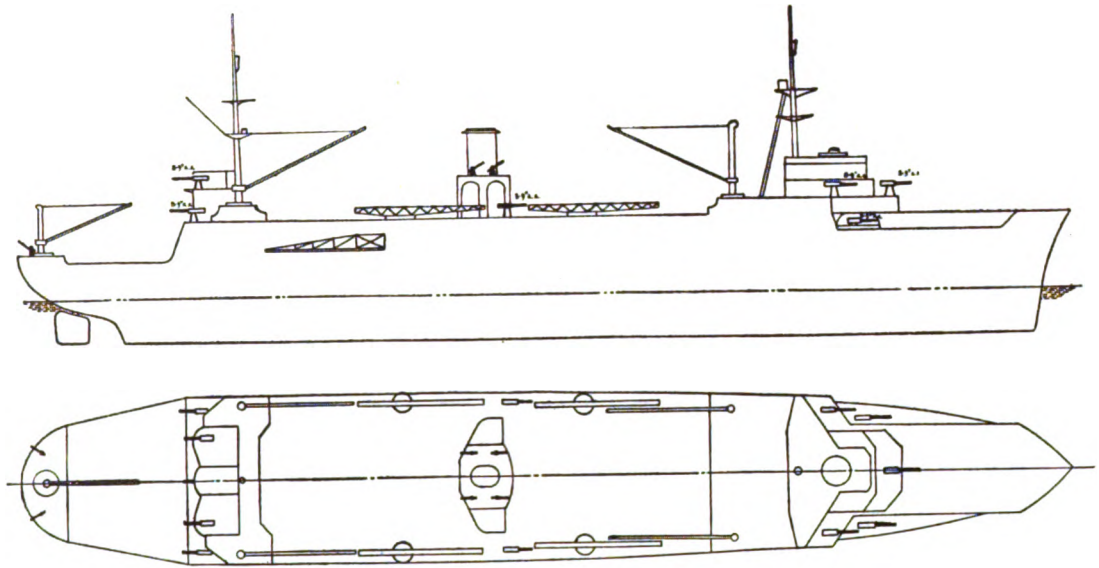
FRANCE.

AVIATION TRANSPORT.

Commandant Teste.



Length (extreme), 548 ft.; 10,000 tons; Speed, 20½ knots; Completed, 1932.
Armament, 12—3·9-in. A.A.; 8—3-pdr. A.A.; 12 M.; 20 planes.

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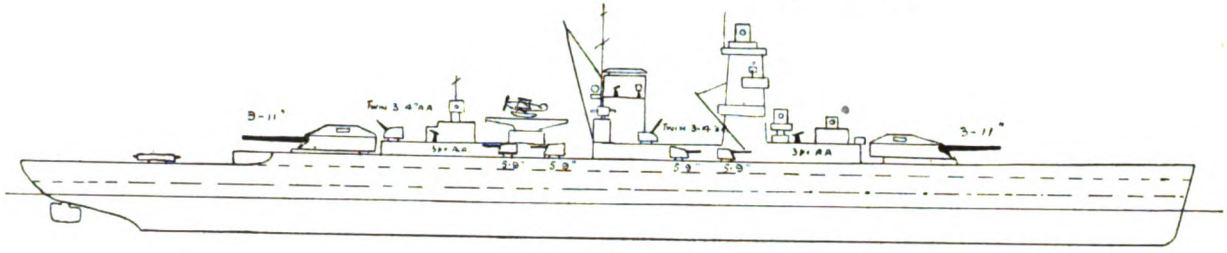
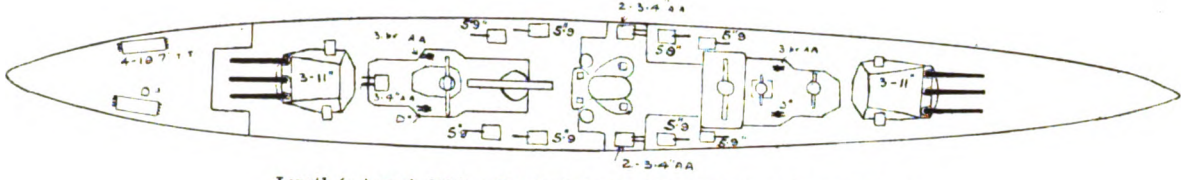
GERMANY.

ARMOURED SHIPS.

Admiral Scheer. **Admiral Graf Spee.**





Length (extreme), 609 ft. ; Standard displacement, 10,000 tons : Speed, 26 knots.
Armament, 6—11-in. ; 8—5·9 in. ; 6—3·4 in. A.A. ; 8 M.G. ; 8—19·7 in. torpedo tubes.

Admiral Scheer completed 1935 : Admiral Graf Spee completed 1936.

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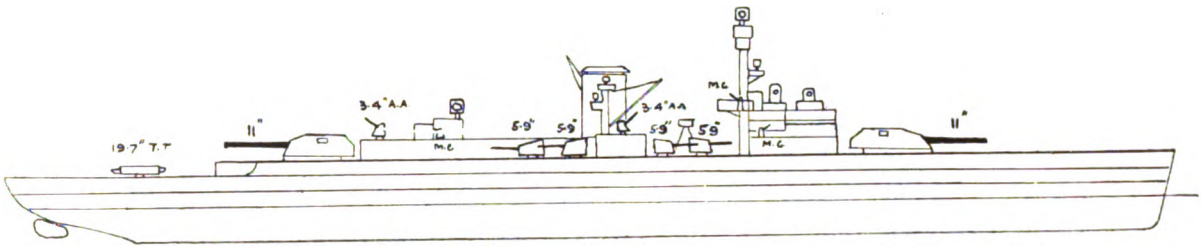
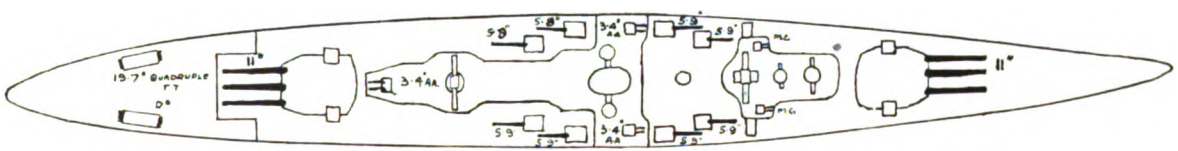
GERMANY.

ARMOURED SHIP.

Deutschland.





Length (extreme), 609 ft. ; Standard displacement, 10,000 tons ; Speed, 26 knots ; Completed, 1933.
Armament, 6—11-in. ; 8—5·9 in. ; 6—3·4 in. A.A. ; 8 M.G. ; 8—19·7 in. torpedo tubes.

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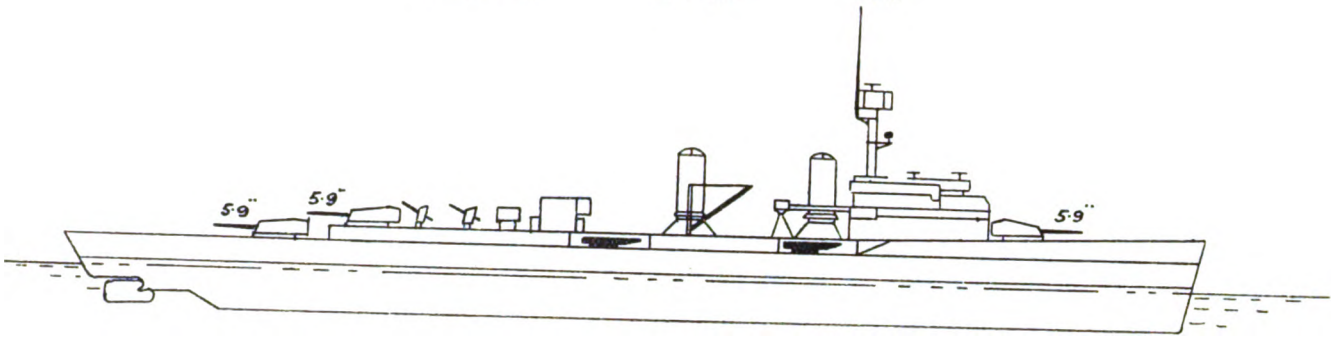
GERMANY.

LIGHT CRUISERS.

Königsberg. Karlsruhe. Köln.



Length (extreme), 570 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1929–30.
Armament, 9—5·9-in.; 4—3·4-in. A.A.; 4 triple 19·7-in. torpedo tubes.

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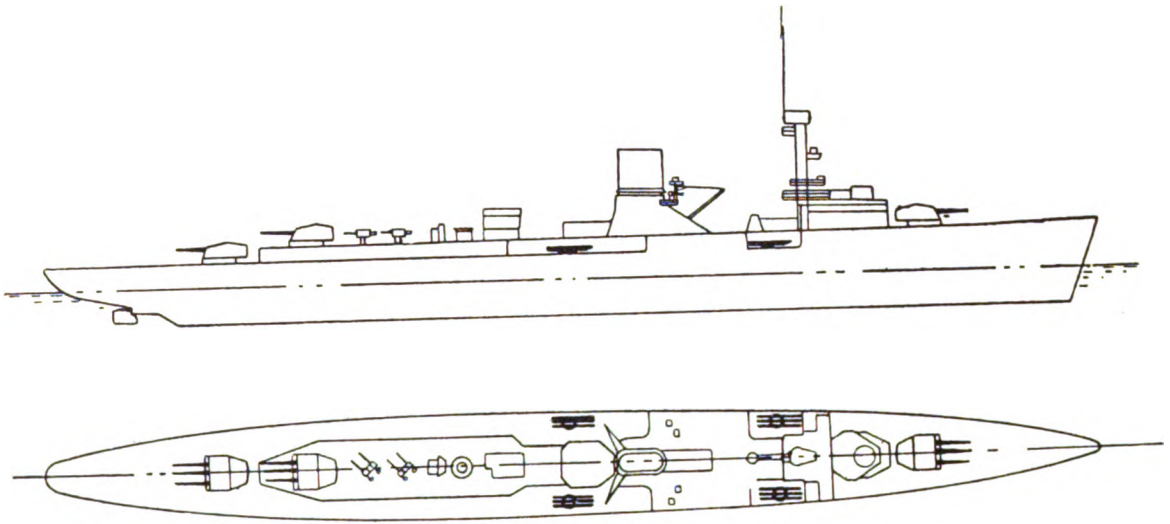
GERMANY.

LIGHT CRUISER,

Leipzig



Length W.L., 543 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1931.
Armament, 9—5·9 in.; 4—3·4 in. A.A.; 4 triple 19·7-in. torpedo tubes.

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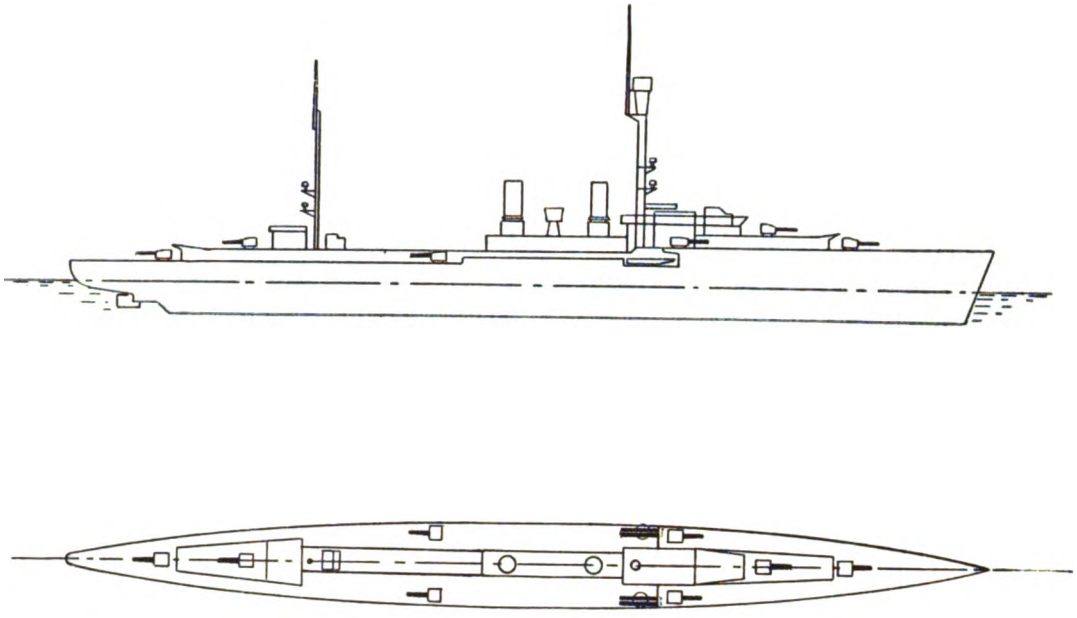
GERMANY.

LIGHT CRUISER.

Emden.



Length (extreme), 510 ft. 2 ins.; 6,000 tons; Speed, 29 knots; Completed, 1925.
Armament. 8—5·9-in.; 2—3·4-in. A.A.: 4—19·7-in. torpedo tubes in twin mountings.
The 8—5·9-in. guns will be mounted in twin mountings, 2 forward and 2 aft, when the mountings are ready.

Correction to plan: The forward funnel is higher than the after one.

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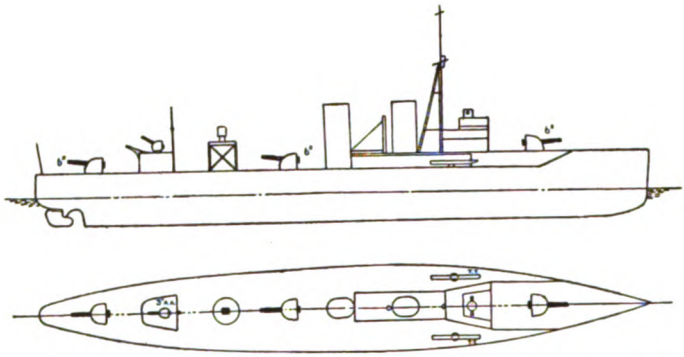
GREECE.

CRUISER.

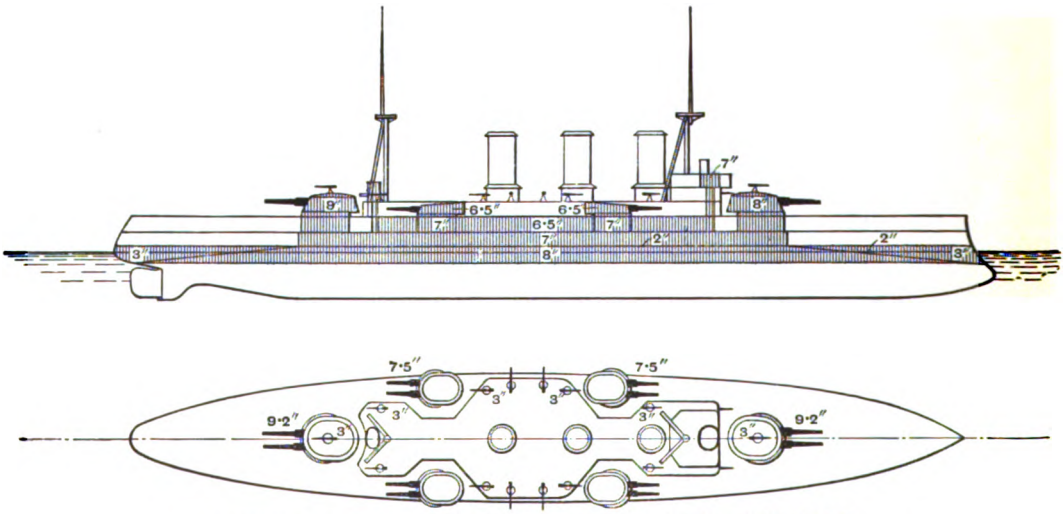
Helle.



Length, 322 ft. ; 2,083 tons ; Speed, 20 knots ; Completed, 1914 ; Reconstructed, 1929.
Armament, 3—6-in.; 1—3-in. A.A. ; 110 mines ; 2—18-in. torpedo tubes.

ARMOURED CRUISER.

Giorgios Averoff.



Length, 462 ft. ; 9,301 tons ; Speed, 24 knots ; Completed, 1911. Refitted, 1927.
Armament, 4—9·2-in. ; 8—7·5-in. ; 16—3-in. ; 2—3-in. A.A. ; 4—3-pr. ; 2 M. ; 3 submerged 18-in. torpedo tubes.

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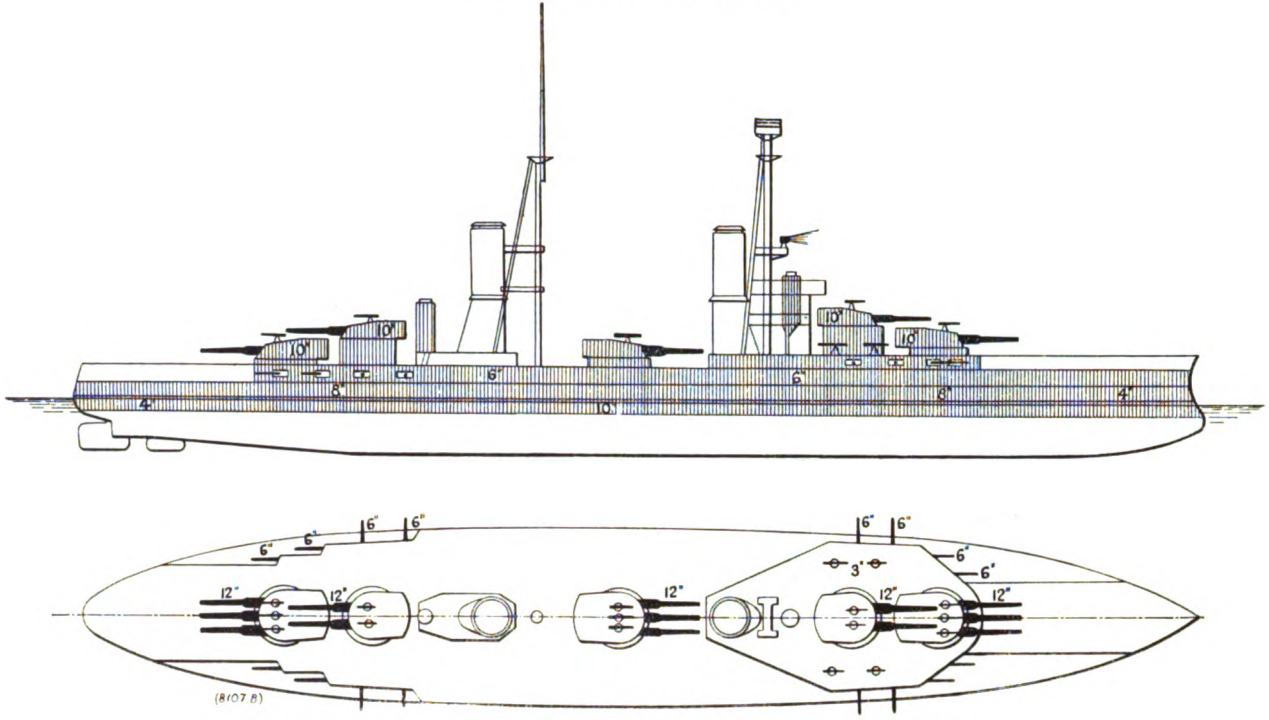
ITALY

BATTLESHIPS.

Andrea Doria. Before modernisation. **Caio Duilio.** See note below.



Length (extreme), 575 ft. 9 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; Completed, 1915.

Armament, 13—12-in. ; 16—6-in. ; 13—3-in. (3 of these are temporarily removed) ; 6—3-in. A.A. ; 2—2-pr. ; 6 M. ; 4 L. ; 2—18-in. torpedo tubes.

NOTE.—These vessels are being reconstructed. The bow is being lengthened by 52 ft., and the amidships turret is being removed. New propelling machinery is being installed to give over 27 knots, and 2 catapults fitted.

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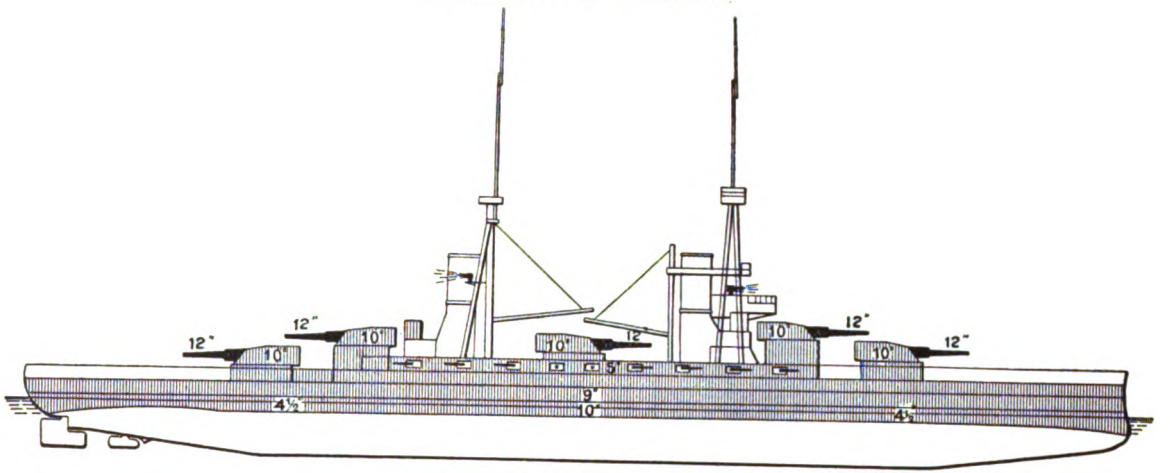
ITALY.

BATTLESHIPS.

Conte di Cavour. **Giulio Cesare.**

Before modernisation. See note below.



Length (extreme), 577 ft. 4 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots ; 22,144 tons ; Completed, 1914–1915.
Armament, 13—12-in. ; 18—4·7-in. ; 13—3-in. (3 of these are temporarily removed) ; 6—3-in. A.A. ; 2—2-pr. ; 2 M. ; 4 L.
A fixed catapult is mounted on port side of Forecastle Deck forward.

NOTE.—These vessels are being reconstructed. Bow is being lengthened by 52 ft , amidships turret removed, new propelling machinery to give a speed of more than 27 knots and 2 catapults are to be fitted.

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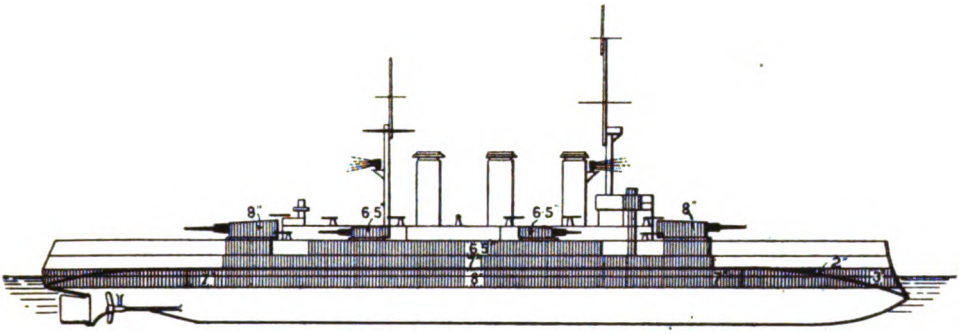
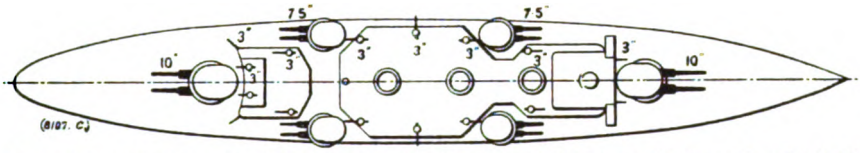
ITALY.

ARMOURED CRUISER.*

Pisa.

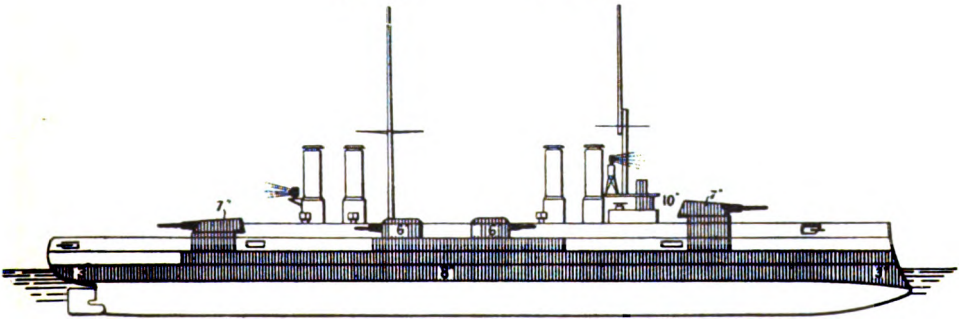


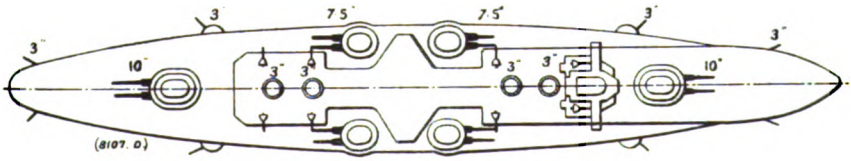


Length (extreme), 460 ft. 11 ins.; Length B.P., 426 ft. 6 ins.; Speed, 22½ knots; 8,759 tons; Completed, 1909.
Armament, 4—10-in.; 8—7·5-in.; 12—3-in.; 6—3-in. A.A.; 4 M.; 2 L.; 2—18-in. torpedo tubes.
Cadets' Training Ship.

ARMOURED CRUISERS *

S. Giorgio. **S. Marco.**





Length (extreme), 462 ft. 2 ins.; Length B.P., 429 ft. 10 ins.;
Speed, 22·5 and 23 knots; 9,232 and 9,350 tons; Completed, 1910 and 1911.
Armament, 4—10-in.; 8—7·5-in.; 10—3-in.; 6—3-in. A.A.; 2—3-pr.; 6 M.; 2 L.; 2—18-in. torpedo tubes.

* Classified as Battleships, 2nd class, in Italian official tests.

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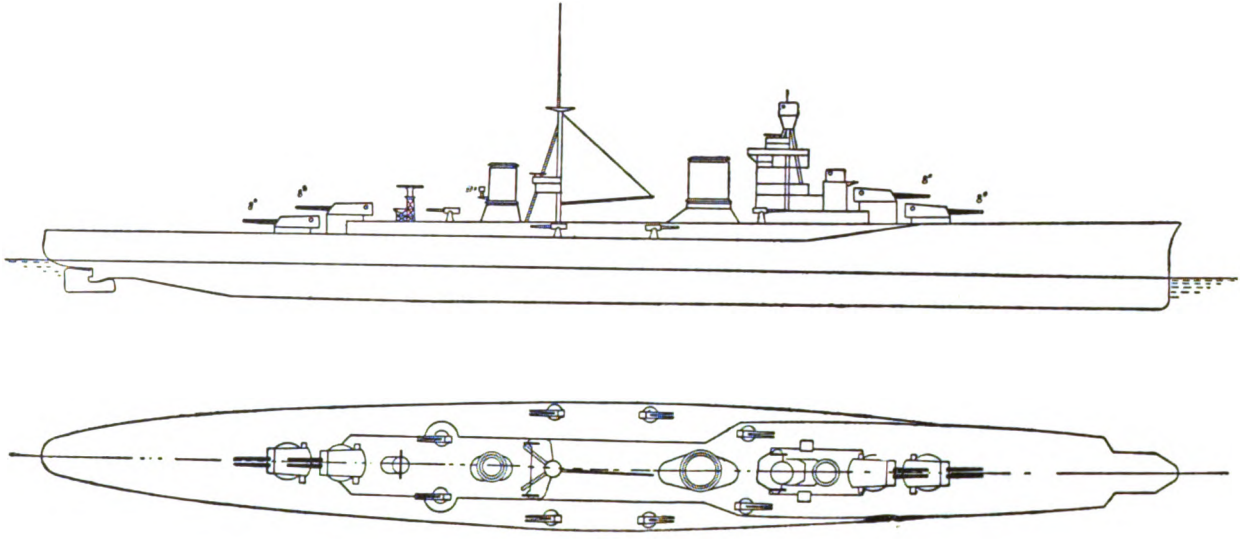
ITALY

CRUISER.

Modified "Trento" Class.

Bolzano.



Length B.P., 644 ft.; 10,000 tons; Completed, 1932.
Armament, 8—8-ins.; 16—3·9-in. A.A.; 12 smaller; 2 catapults.
8—21-in. torpedo tubes may be fitted.

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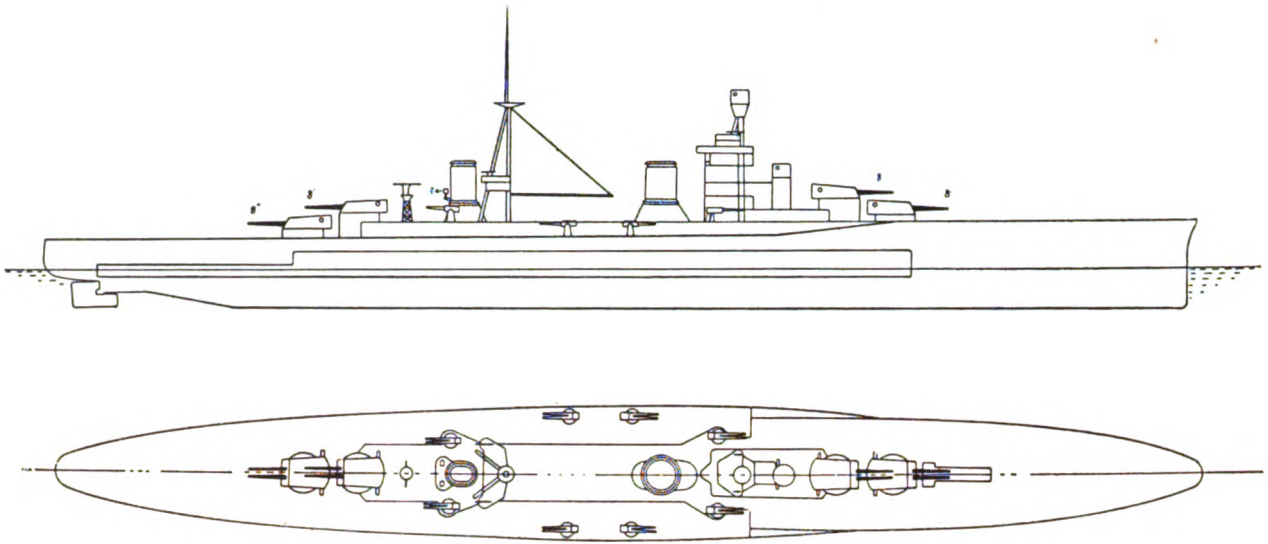
ITALY.

CRUISERS.

"Zara" Class

Pola. Zara. Fiume. Gorizia.



Length: Zara and Fiume, 599 ft. 5 ins.; Pola, 600 ft.; Gorizia, 590 ft. 9 ins.; 10,000 tons; Speed, 32 knots.
Armament, 8—8-in.; 16—3·9-in.; 12 smaller.
1 catapult; 2 aircraft.

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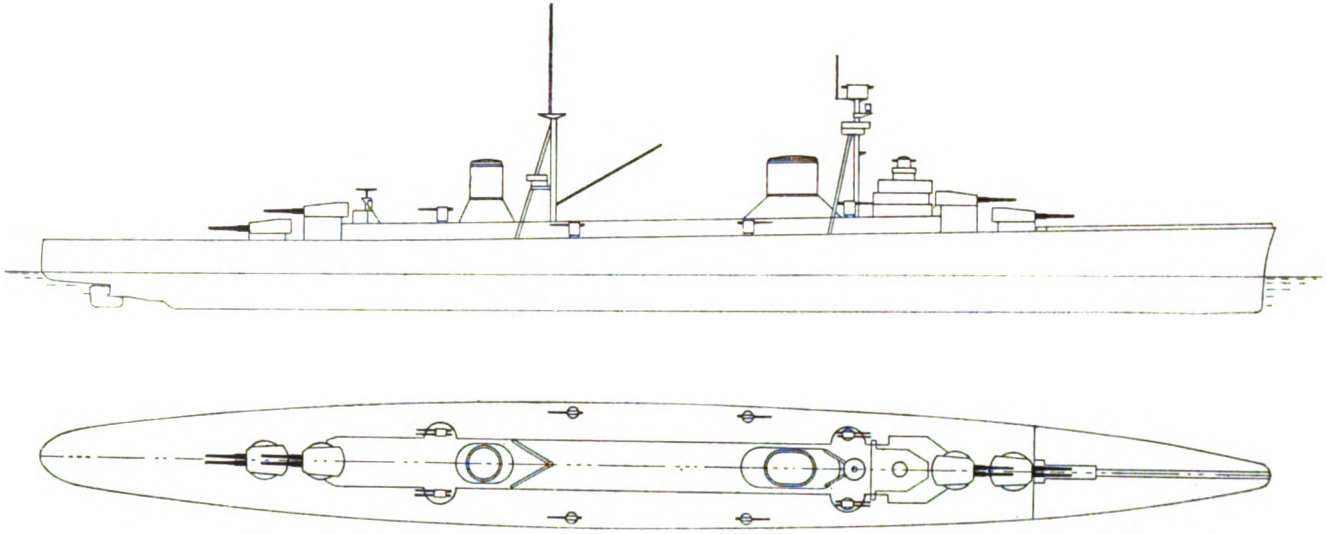
CRUISERS.

"Trento" Class.

Trento. Trieste.



Length (extreme), 646 ft. 2 ins. ; 10,000 tons ; Speed, 35 knots ; Completed, 1929.
Armament, 8—8-in. ; 16—3·9-in. ; 4—1 pdr. ; 8 M.G. ; 4 twin torpedo tubes.
1 catapult ; 2 aircraft.

Correction to plan : The 4-in. guns between the funnels are twin guns.

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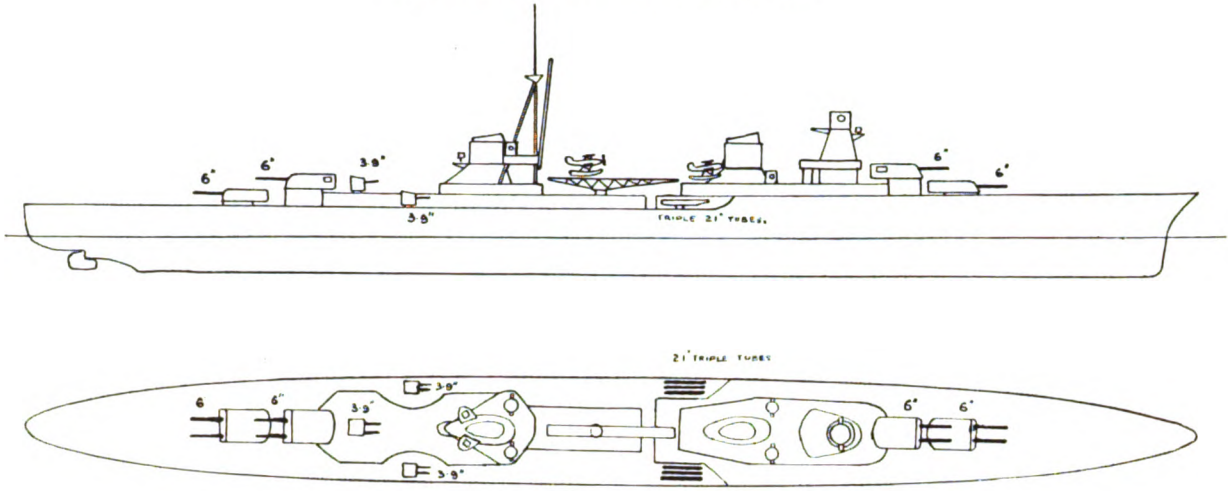
ITALY.

CRUISERS.

"Attendolo" Class.

Eugenio di Savoia and Filiberto Duca d'Aosta.



Length (extreme), 613 ft. 4 ins.; 6,791 tons; Speed, 36½ knots.
Armament, 8—6-in.; 6—3·9 in.; 8—1 pr. A.A.; 8 M.G.; 2 triple 21-in. torpedo tubes; 1 catapult; 3 aircraft.

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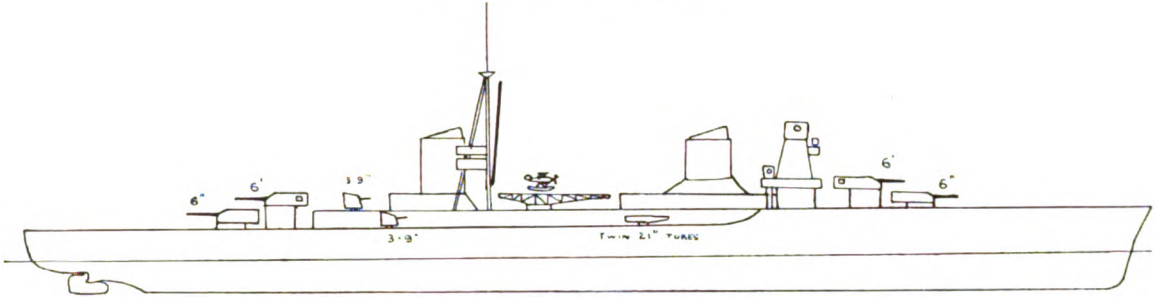
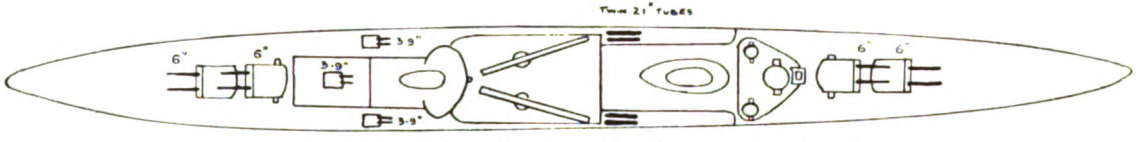
ITALY.

CRUISERS

"Condottieri" Class.

Montecuccoli and Muzio Attendolo.





Length (extreme), 597 ft. : 5,857 tons ; Speed, 37 knots : Completed, 1935.
Armament, 8—6-in. ; 6—3·9-in. A.A. : 8 M.G. : 2 twin 21-in. torpedo tubes ; 2 catapults ; 2 aircraft.

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ITALY.

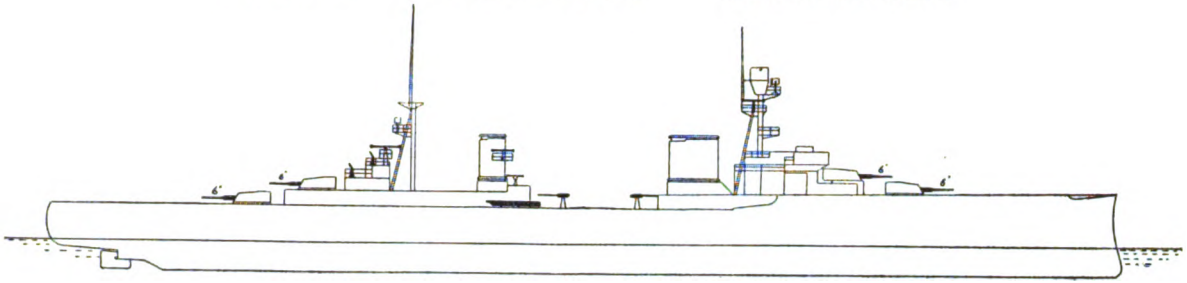
CRUISERS.

"*Condottieri*" *Class.*

Armando Diaz.*
Luigi Cadorna.*

Alberto di Guissano.
Alberico di Barbiano.

Bartolomeo Colleoni.
Giovanni della Bande Nere.



Length (extreme), 556 ft. 5 ins.; 5,069 tons (*554 ft. 6 ins., 5,008 tons); Speed, 37 knots; Completed, 1931–33.
Armament, 8—6-in.; 6—3·9-in A.A.; and smaller guns; 4 torpedo tubes.
1 catapult and 2 seaplanes.

Corrections to plan: The bridge and foremast have been modified. The after twin 3·9-in. A.A. gun is at the superstructure level on a raised platform.
* In the Armando Diaz and Luigi Cadorna the mainmast is forward of the after funnel, the torpedo tubes are abreast the forward funnel, and the positions of the twin A.A. guns are reversed, the foremost gun being at forecastle deck level and the two after guns at upper deck level.

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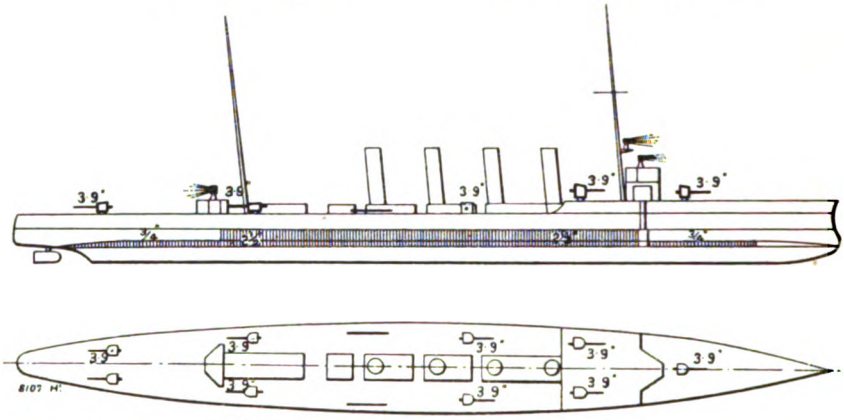
ITALY.

LIGHT CRUISERS.*

Venezia (*ex-Austrian* **Saida**). **Brindisi** (*ex-Austrian* **Heligoland**).

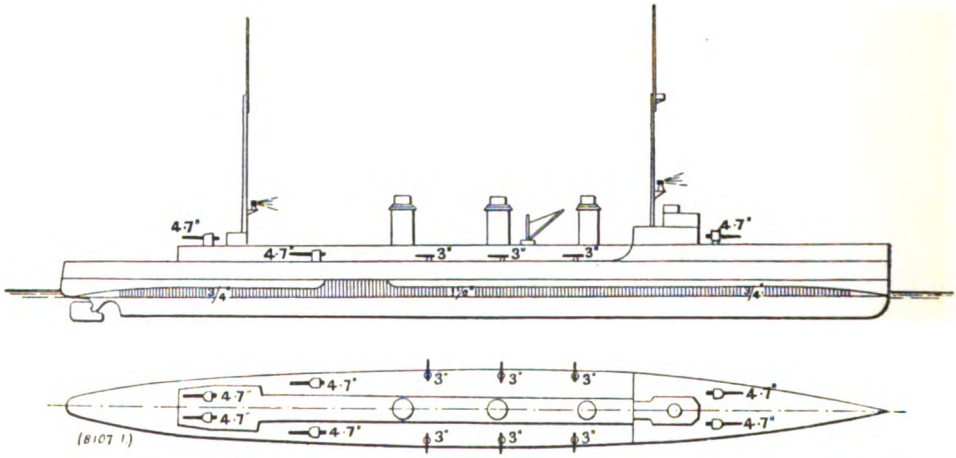


Length (extreme), 430 ft.; Length W.L., 416 ft. 9 ins.; Speed, 27 knots; 2,756 tons; Completed, 1914.
Armament, 9—3·9-in.; 1—3-in. A.A.; 170 mines; 4 torpedo tubes.

NOTE.—Thionville (*ex-Austrian* Novara), sister ship, allocated to France.

LIGHT CRUISER.*

Quarto.



Length (extreme), 431 ft. 9 ins.; Length B.P., 413 ft. 5 ins.; Speed, 28 knots; 2,903 tons; Completed, 1913.
Armament, 6—4·7-in.; 6—3-in.; 2—2-pr. A.A.; 2 above-water 18-in. torpedo tubes; 126 mines.

* Classified as Scouts in Italian official tests.

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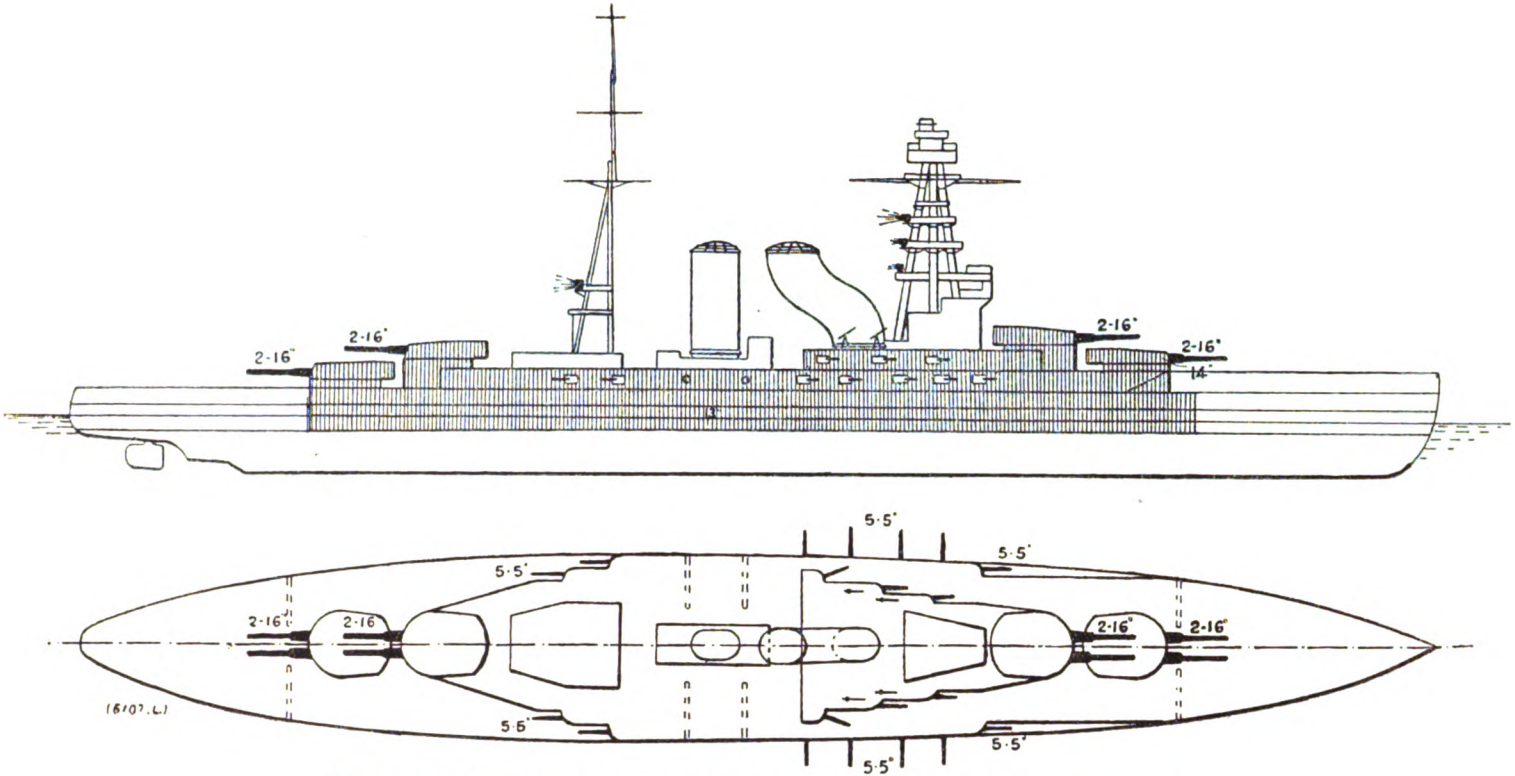
JAPAN.

BATTLESHIPS.

"*Nagato*" *Class.*

Nagato. **Mutsu.**



Length (extreme), 700 ft. ; Length B.P., 660 ft. 7 ins. ; Speed, 23 knots ; 32,720 tons ; Completed, 1920–1921.
Armament, 8—16-in. ; 20—5·5-in. ; 4—5-in. A.A. ; 4 above-water and 4 submerged 21-in. torpedo tubes.

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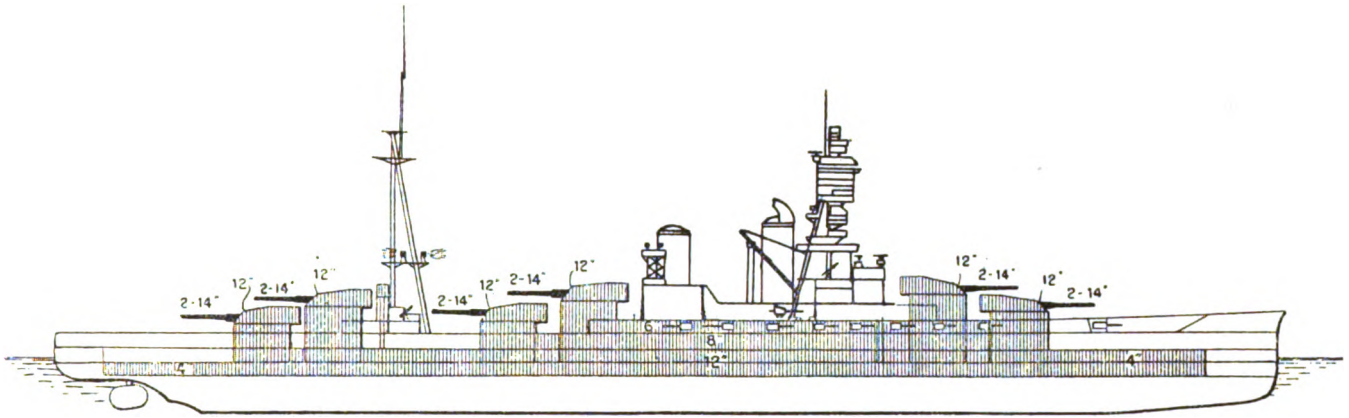
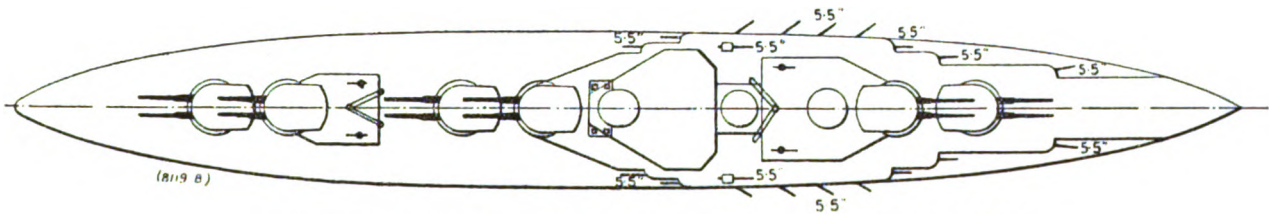
JAPAN.

BATTLESHIPS.

"*Fuso*" *Class.*

Ise. **Hyuga.**





Length (extreme), 683 ft. ; Length B.P., 640 ft. ; Speed, 23 knots ; 29,990 tons ; Completed, 1917-18.
Armament, 12—14-in. ; 20—5·5-in. ; 4—3-in. A.A. 6 submerged 21-in. torpedo tubes.
2 seaplanes.

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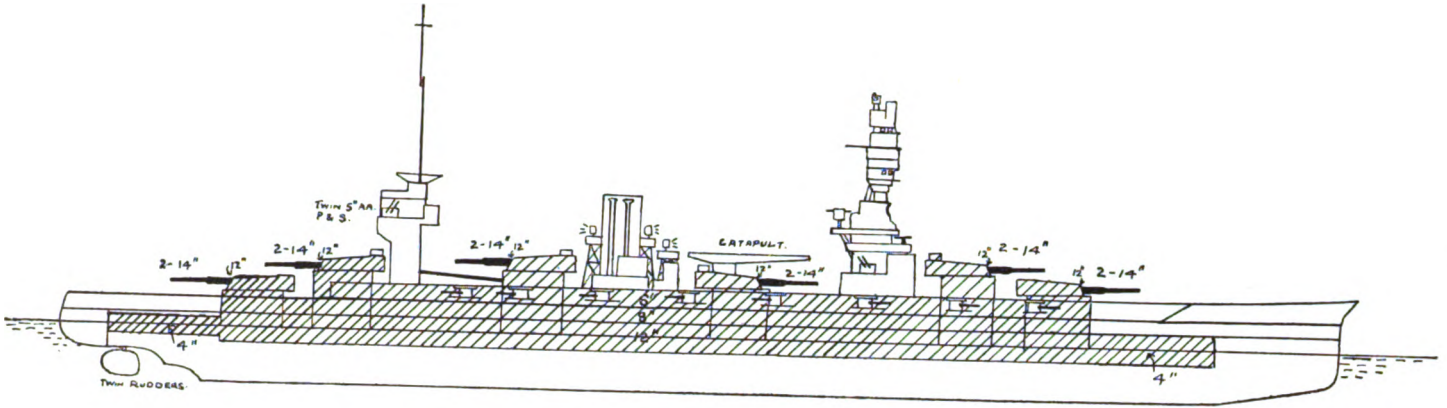
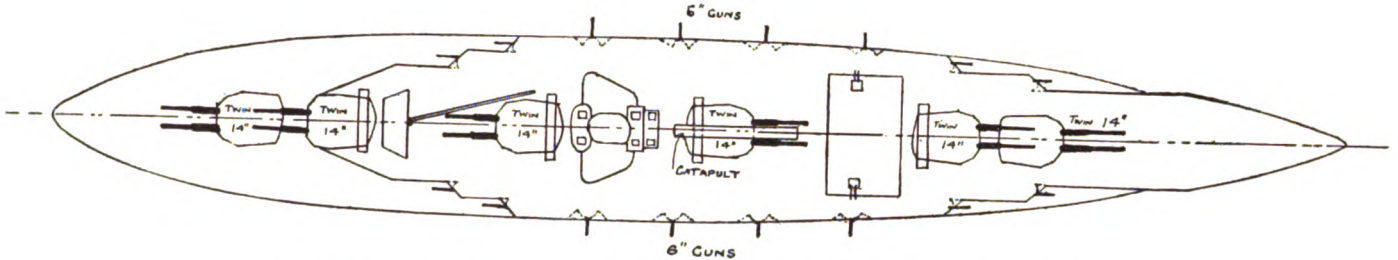
BATTLESHIPS.

"Fuzo" Class.

Fuzo. **Yamashiro.**

(After reconstruction, 1934.)





Length (extreme), 673 ft. ; Length B.P., 630 ft. ; Speed, 22¼ knots ; 29,330 tons (standard) ; Completed, 1915.
Armament, 12—14-in. ; 16—6-in. ; 8—5-in. A.A. ; 4 M.G. ; 4 L. ; 2 submerged 21-in. torpedo tubes.
1 catapult ; 1 seaplane.

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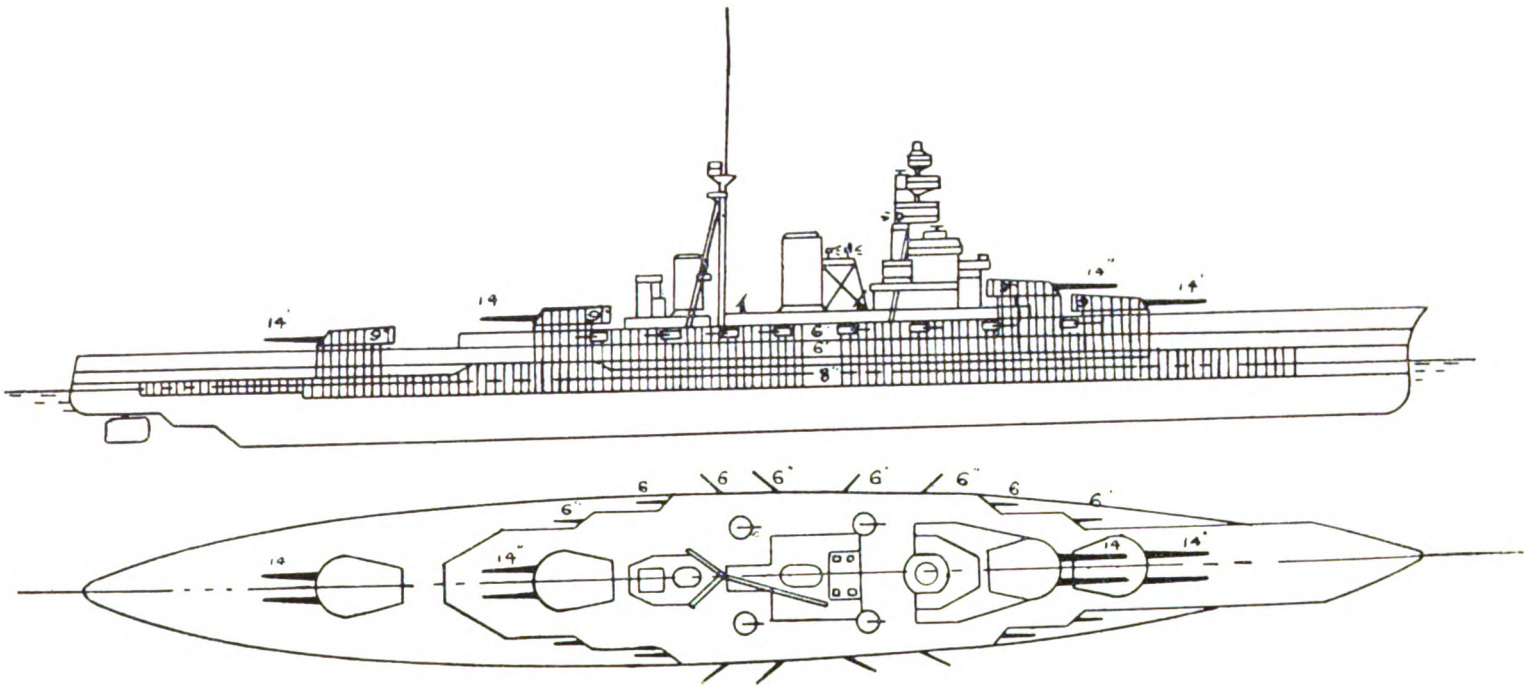
BATTLESHIPS.

"*Kongo*" *Class.*

Haruna. **Kirishima.** **Kongo**



Length (extreme), 704 ft. ; Speed, 26 knots ; 29,330 tons ; Completed, 1914-15 ; Modernised 1928-31.
Armament, 8—14-in. ; 16—6-in. ; 4—3-in. A.A. ; 4 submerged 21-in. torpedo tubes.

Hiyei of this class has been converted to a Training Ship in accordance with the London Naval Treaty.

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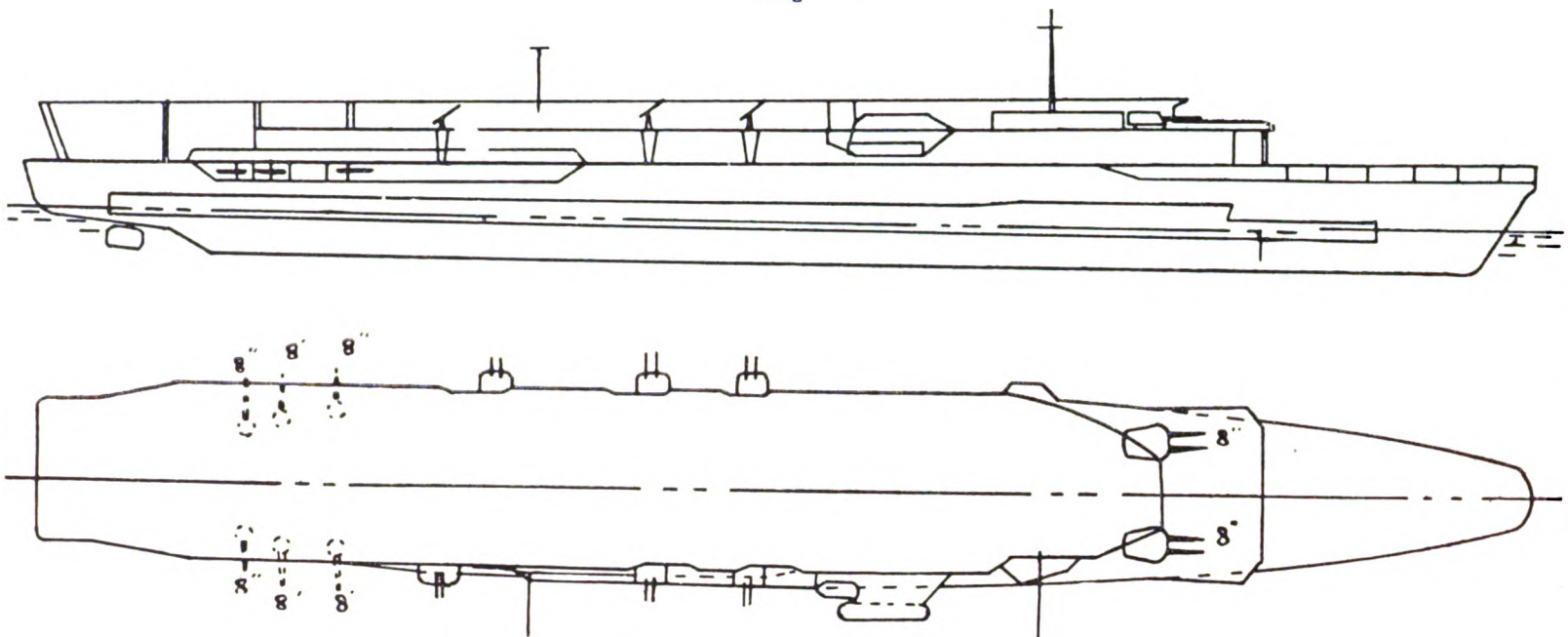
JAPAN

AIRCRAFT CARRIER.

Akagi.



Length (between perpendiculars), 763 ft. ; 26,900 tons ; Speed, 28·5 knots ; Completed, 1927.
Armament, 10—8-in. ; 12—4·7-in. A.A. Accommodation for 50 planes.

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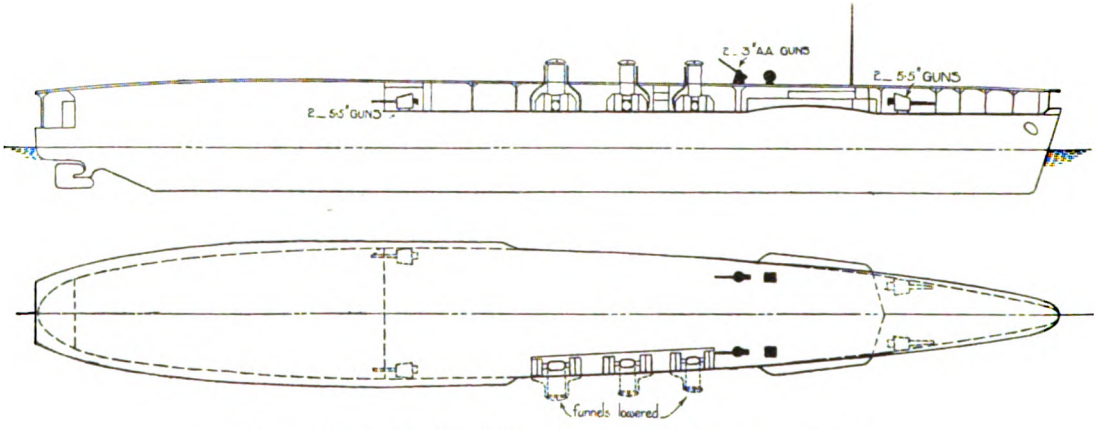
JAPAN.

AIRCRAFT CARRIER.

Hosho

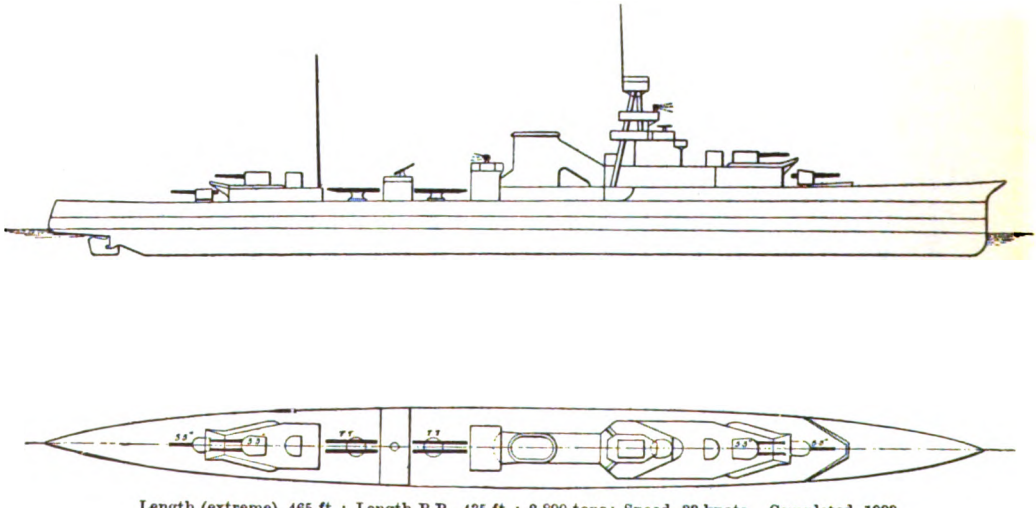


Displacement, 7,470 tons; Length B.P., 510 ft.; Speed, 25 knots; Completed, 1922.
Armament, 4—5·5-in.; 2—3-in. A.A.; Carries about 28 planes; Fitted with gyro-stabiliser.

JAPAN.

LIGHT CRUISER.

Yubari.



Length (extreme), 465 ft.; Length B.P., 435 ft.; 2,890 tons; Speed, 33 knots. Completed, 1923.
Armament, 6—5·5-in.; 1—3-in. A.A.; 2 M.; 2 twin 21-in. torpedo tubes; 34 mines.

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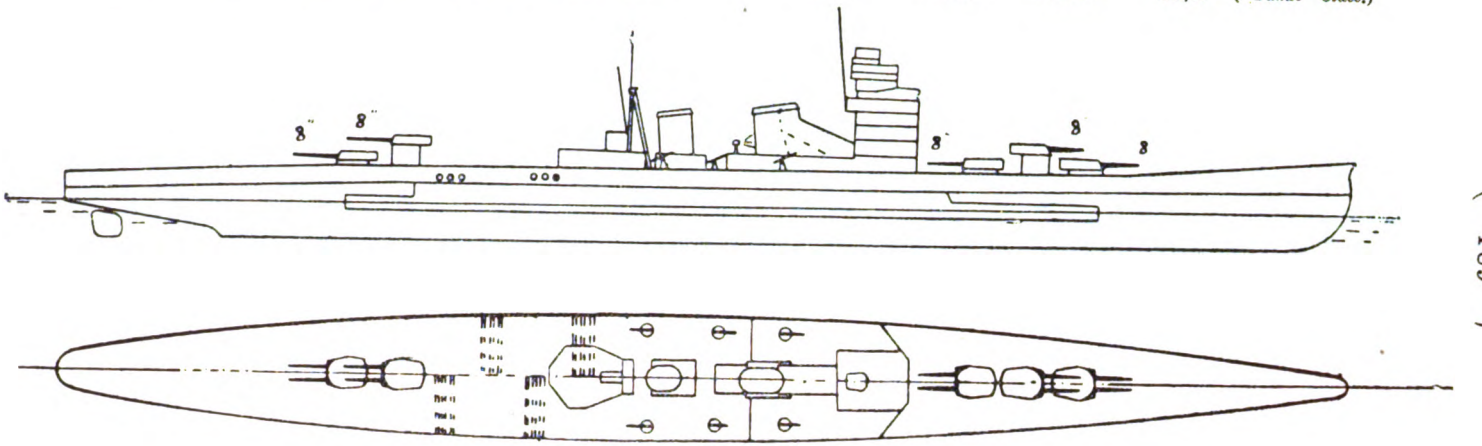
JAPAN.

CRUISERS,

Nachi. Myoko. Ashigara Haguro. (*"Nachi" Class.*) Atago.* Takao.* Chokai.* Maya.* (*"Takao" Class.*)



Length (between perps.), 630 ft.; "Nachi" Class, 10,000 tons; "Takao" Class, 9,850 tons; speed, 33 knots.
Armament, 10—8-in.; 6—4·7-in. A.A.; 12—21-in. torpedo tubes.

* These have 4—4·7-in. A.A., and 8—21-in. torpedo tubes.

Corrections to plan: In the "Takao" class the after funnel is vertical, and the torpedo tubes are beneath the funnels on a deck higher. The four 4·7-in. A.A. guns are also a deck higher. In the "Nachi" Class the foremost pair of 4·7-in. A.A. guns are a deck higher.

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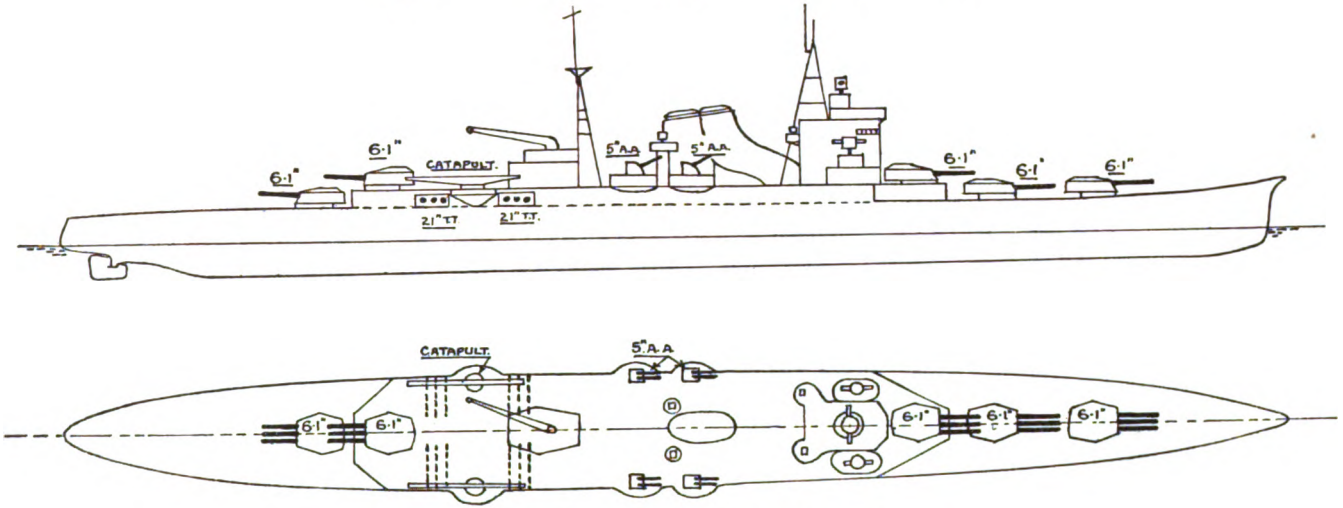
JAPAN.

CRUISERS.

"Mogami" class.

Mogami. Mikuma. Suzuya. Kumano. Tone.



Length (extreme), 640 ft. ; 8,500 tons ; Speed, 33 knots.

Armament, 15—6·1 in. ; 8—5-in. A.A. ; 12—21-in. torpedo tubes ; 2 catapults, 4 aircraft.

Mogami and Mikuma completed 1935 ; Suzuya, 1936 ; Kumano and Tone still under construction.

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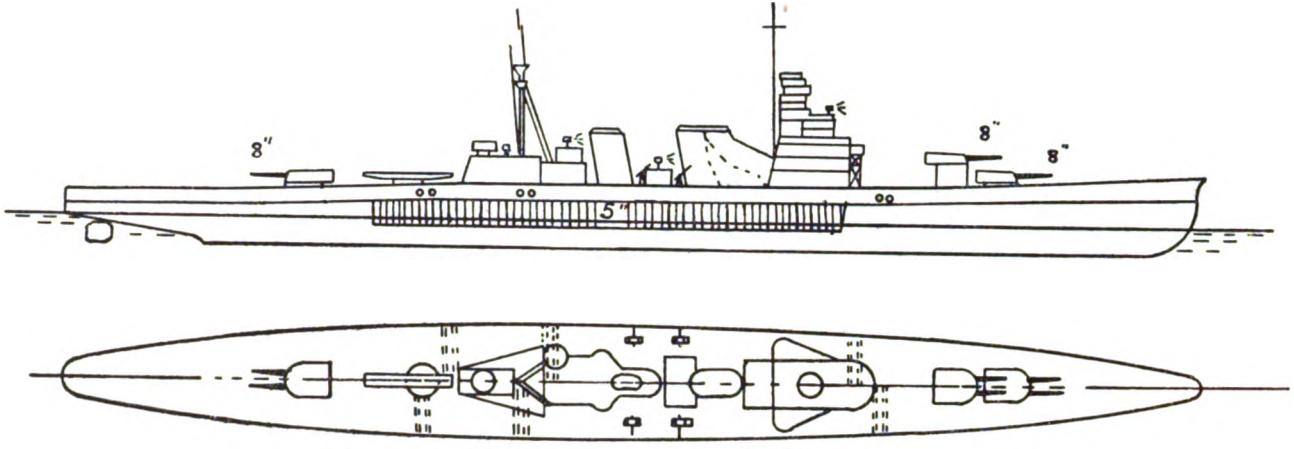
JAPAN.

CRUISERS.

"Furutaka" Class.

Aoba. Kinugasa.



Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots.
Armament, 6—8-in. ; 4—4·7-in. A.A. ; 12—21-in. torpedo tubes.
1 catapult ; 2 aircraft.

Correction to plan : The tops of the funnels are square to the funnels.

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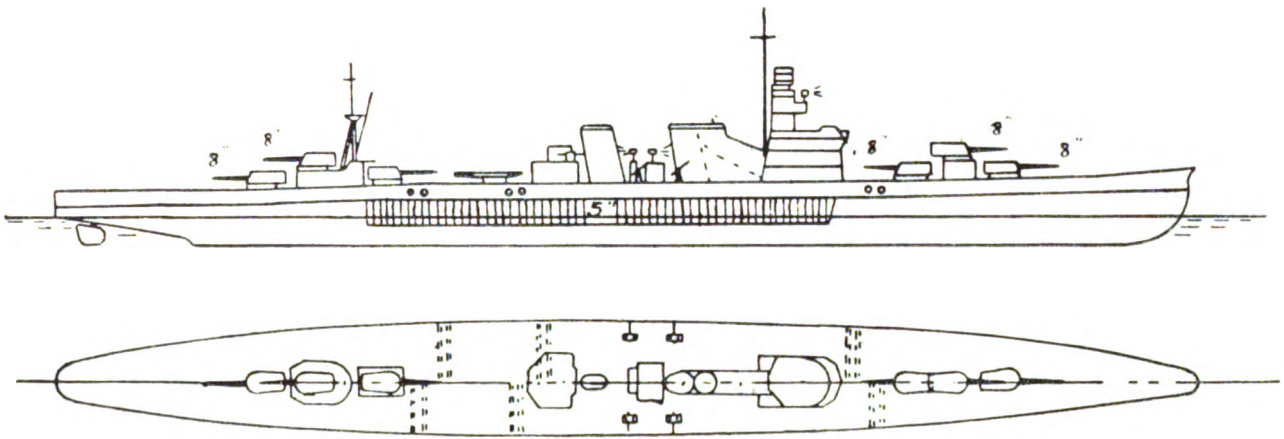
JAPAN.

CRUISERS.

Furutaka ' Class.

Furutaka. **Kako.**



Length (extreme), 595 ft. ; 7,100 tons ; Speed, 33 knots.
Armament, 6—8-in. ; 4—3-in. A.A. ; 12 above-water 21-in. torpedo tubes.
1 catapult ; 1–2 aircraft.
Correction to plan : The tops of the funnels are square to the funnels.

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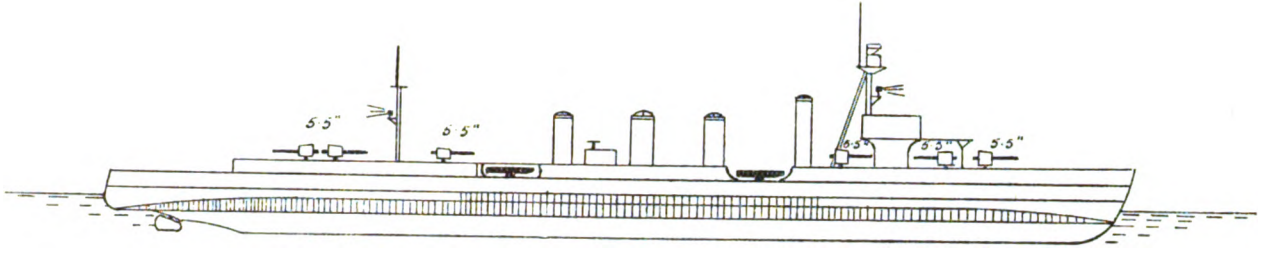
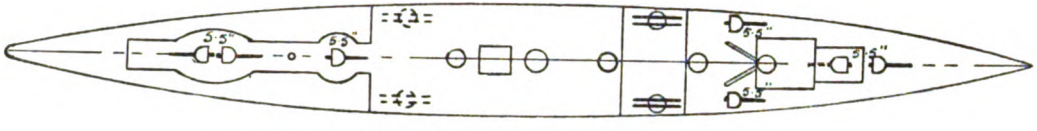
JAPAN.

LIGHT CRUISERS.

"Sendai" Class.

Naka. Sendai. Jintsu.





Length (extreme), 535 ft. ; Speed, 33 knots ; 5,195 tons ; Completed, 1924–25
Armament, 7—5·5-in. ; 2—3-in. A.A. ; 4 twin 21-in. torpedo tubes.
1 seaplane.
Correction to plan : Bows of Jintsu and Naka have been modified to give more flair.

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JAPAN.

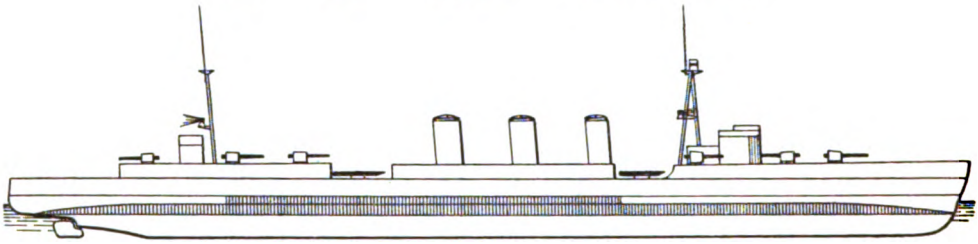
LIGHT CRUISERS.

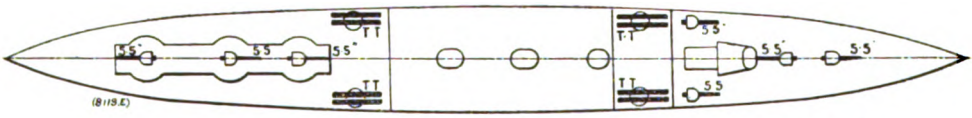
"Natori" Class.

* { Isudzu. Nagara. } * { Natori. Yura. } * { Kinu. Abukuma. }

"Kuma" Class.

Oi. Kiso. Kitakami. Tama Kuma.





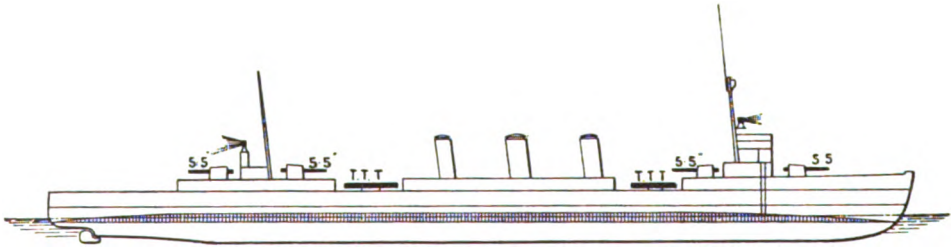
Length (extreme), 535 ft. ; Length B.P., 500 ft. ; Speed, 33 knots ; 5,100 tons ; Completed, 1920–21.
Armament, 7—5·5-in. ; 2—3-in. A.A. ; 2 M. ; 4 twin above-water 21-in. torpedo tubes.

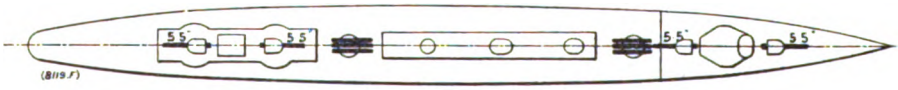
* Plans apply generally to these vessels except that aircraft hangar and a catapult are arranged in bridge structure. The displacement is 70 tons higher than Oi, etc. These vessels were completed, 1922–23.

LIGHT CRUISERS

"Tenryu" Class.

Tatsuta. Tenryu.





Length (extreme), 468 ft. ; Speed, 31 knots ; 3,230 tons ; Completed, 1919
Armament, 4—5·5-in. ; 1—3-in. A.A. ; 2 M. ; 2 triple above-water torpedo tubes.
Fitted for Minelaying

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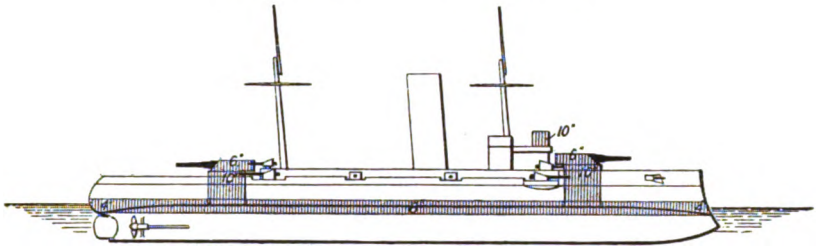
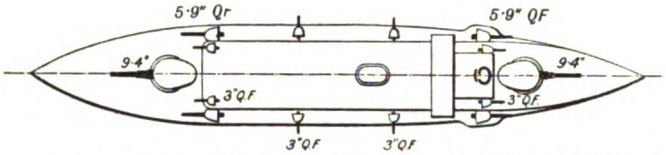
NETHERLANDS.

COAST DEFENCE SHIPS.

Hertog Hendrik. **Marten Tromp.**





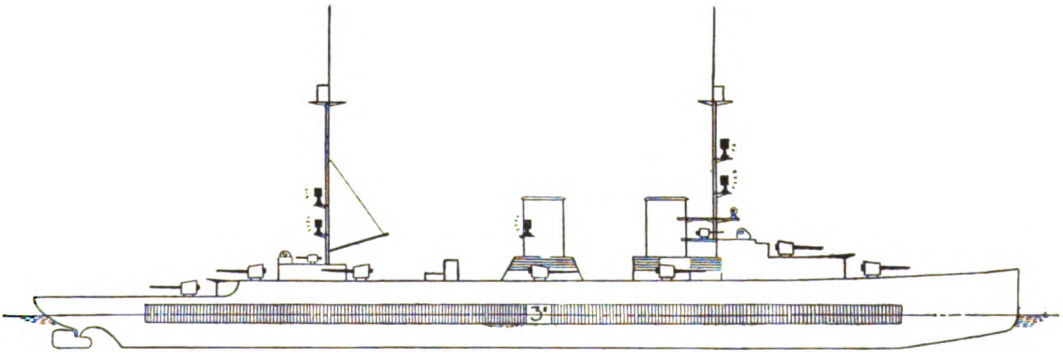
Hertog Hendrik: Length, 317 ft.; 4,371 tons; Speed, 16 knots; Completed, 1903.
2—9·4-in.; 6—5·9-in.; 4—3-in.; 7 small.

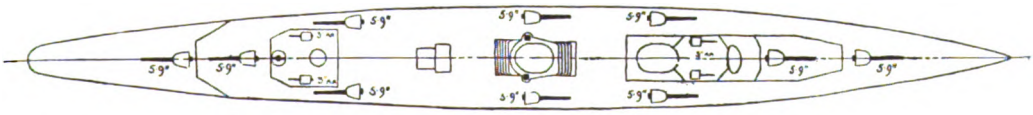
Marten Tromp: Length, 330 ft.; 4,562 tons; Speed, 16 knots; Completed, 1906.
2—9·4-in.; 4—5·9-in.; 8—3-in.; 7 small.

NETHERLANDS.

CRUISERS.

Java. **Sumatra.**





Length, 509¼ ft.; 6,670 tons; Speed, 30 knots; Completed, 1925–26
Armament, 10—5·9 in.; 4—3-in. A.A.; 8 M.
40 mines; 2 seaplanes.

Correction to plans: These cruisers have been reconditioned. The 4—3-in. A.A. have been removed. The mainmast has been shortened and moved forward. 3—4-cm. machine guns have been fitted each side of the after deck house. The forward 4-sided 5·9-in. have been raised a deck to the signal deck, which has been extended aft for the purpose.

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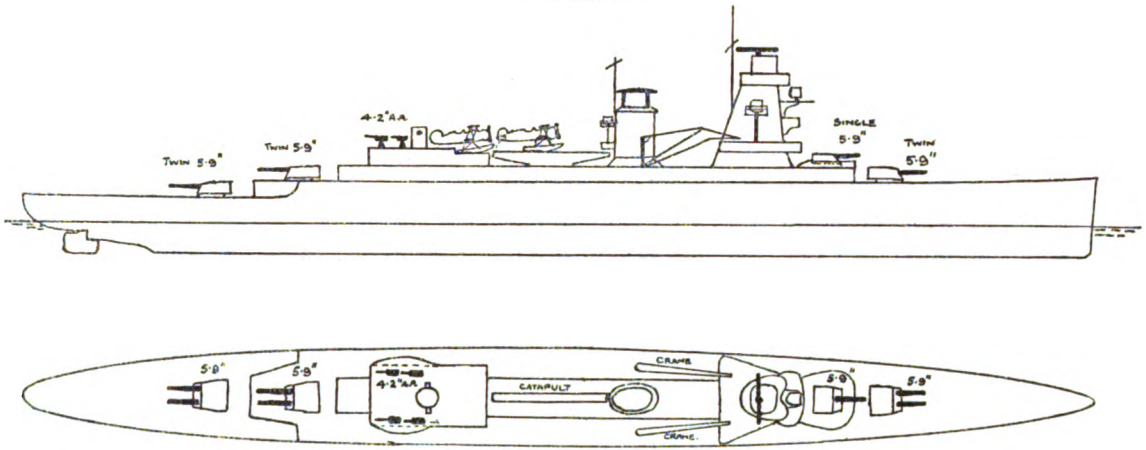
NETHERLANDS.

CRUISER.

De Ruyter.



Length (extreme), 560 ft.; 6,550 tons; Speed, 32 knots.
Armament, 7—5·9-in.; 4—4·2-in. A.A.; 4 M.G.; 1 catapult; 2 seaplanes.

Completed 1936.

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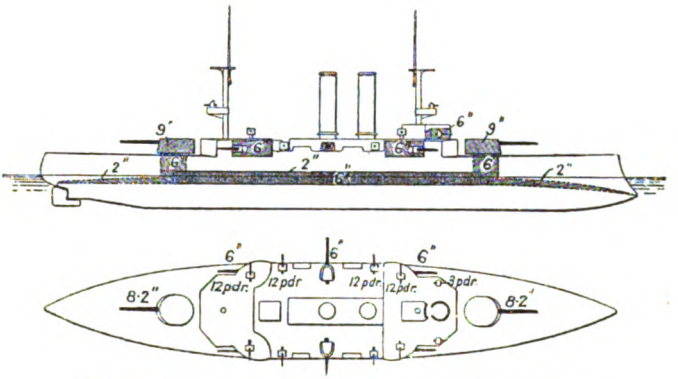
NORWAY.

COAST DEFENCE SHIPS.

Norge. **Eidsvold**

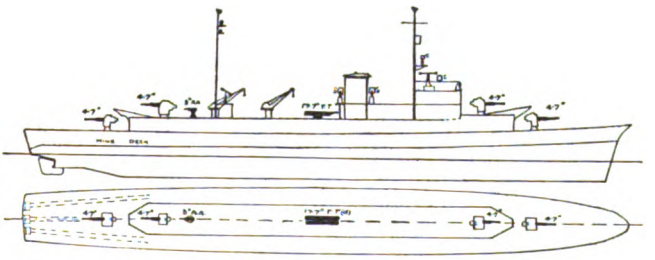


Length, 310 ft.; 4,166 tons; Speed, 16·5 knots; Completed, 1901.
Armament, 2—8·2-in.; 6—6-in.; 8—3-in.; 6—3-pr.; 2 submerged 18-in. torpedo tubes.

NORWAY.

MINELAYER AND TRAINING SHIP.

Clav Trygvason



Length, 319¼ ft.; 1,747 tons; speed, 21¾ knots; Completed, 1934.
Armament, 4—4·7-in.; 1—3-in. A.A.; 2—17·7-in. torpedo tubes.
280 mines.

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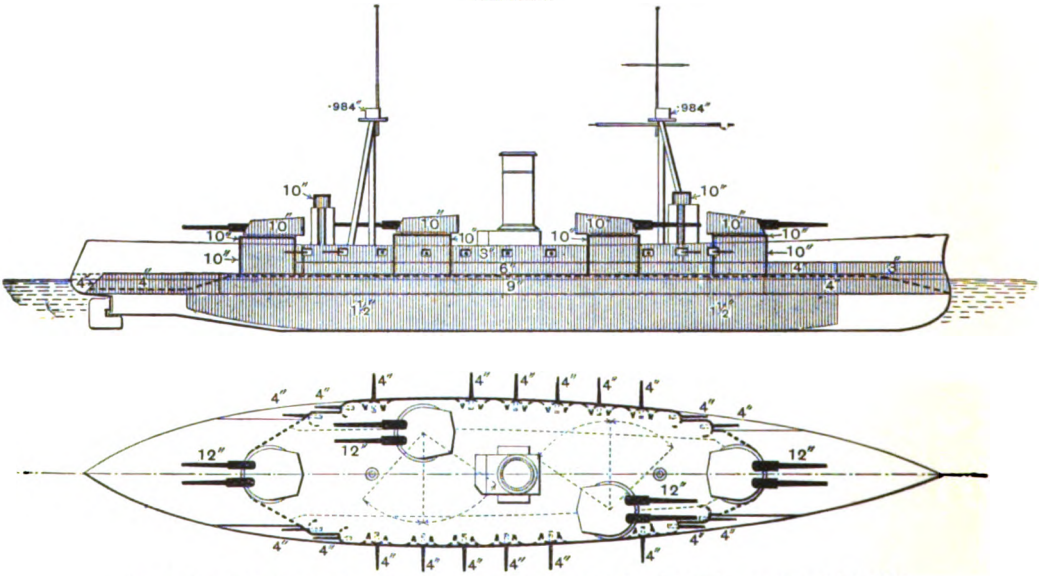
SPAIN

BATTLESHIP.

Jaime I.



Length (extreme), 459 ft. ; Length W.L., 435 ft. ; 14,224 tons ; Speed, 19·5 knots ; Completed, 1921.
Armament, 8—12-in. ; 20—4-in. ; 4—3-pr. ; 4—3 pr. A.A. ; 2 M.

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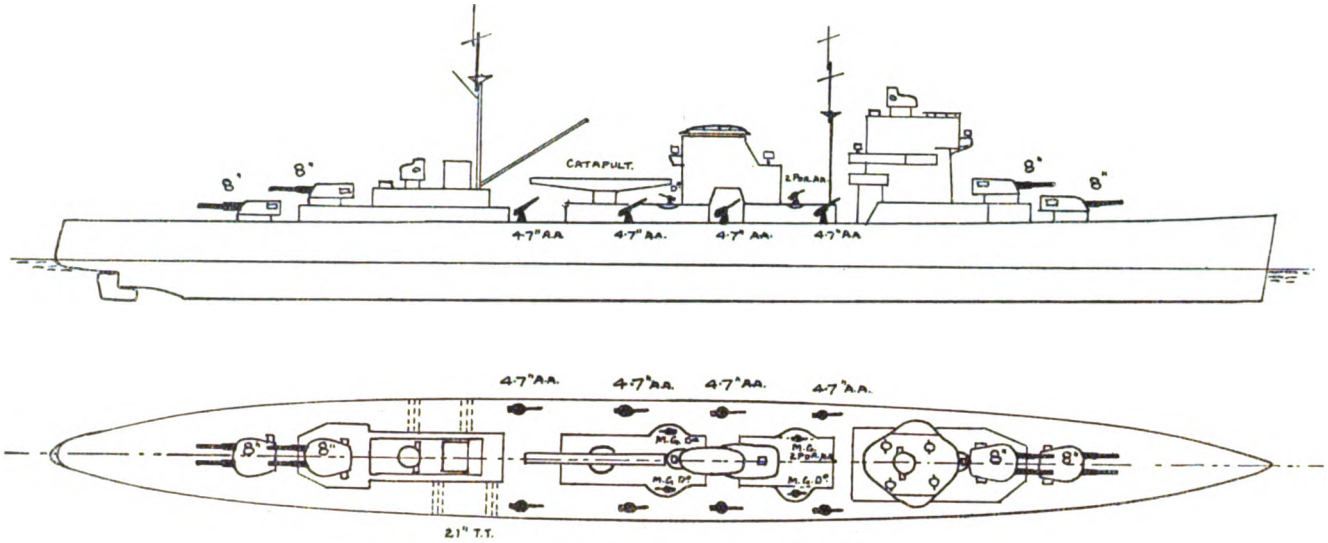
SPAIN.

CRUISERS.

Baleares. Canarias.



Length (extreme), 636 ft. ; 10,000 tons ; 33 knots ; Completed, 1934.

Armament, 8—8-in. ; 8—4·7-in. A.A. ; 4—2-pdr. A.A. ; 12—21-in. torpedo tubes ; 1 catapult ; 2 aircraft.

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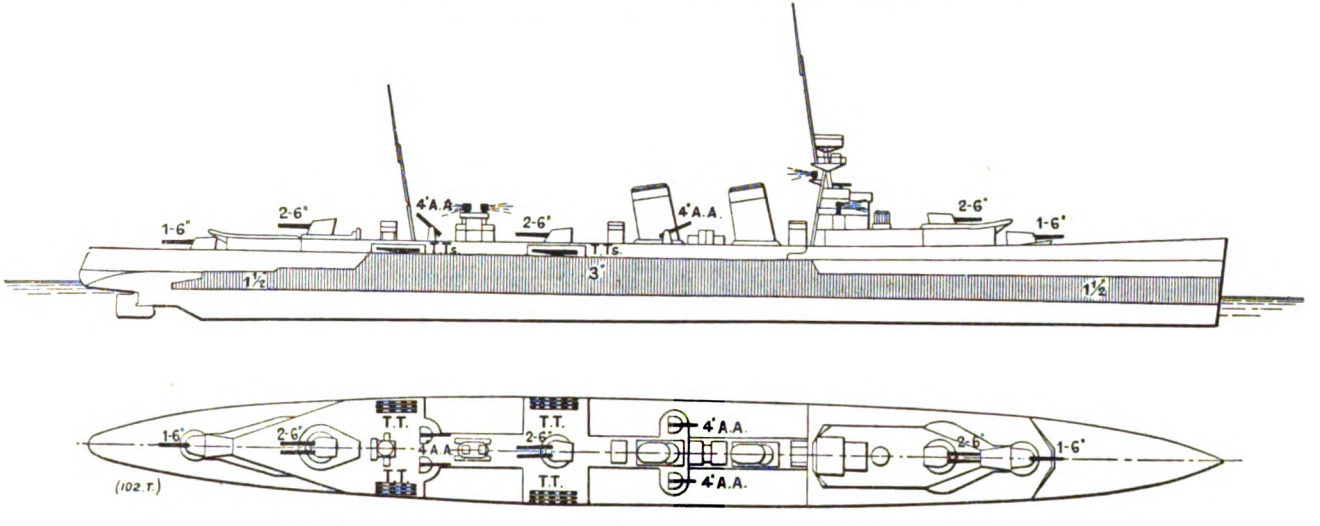
SPAIN.

CRUISERS.

Libertad (*ex*-Principe Alfonso). Almirante Cervera. Miguel de Cervantes.



Length (extreme), 579 ft. 6 ins. ; Length B.P., 545 ft. ; 7,475 tons ; Speed, 33 knots.
Armament, 8—6-in. ; 4—4-in. A.A. ; 2—3 pr. ; 4 triple above-water torpedo tubes (21-in. torpedoes).

Corrections to plan : The mainmast is tripod. There is no foretopmast.

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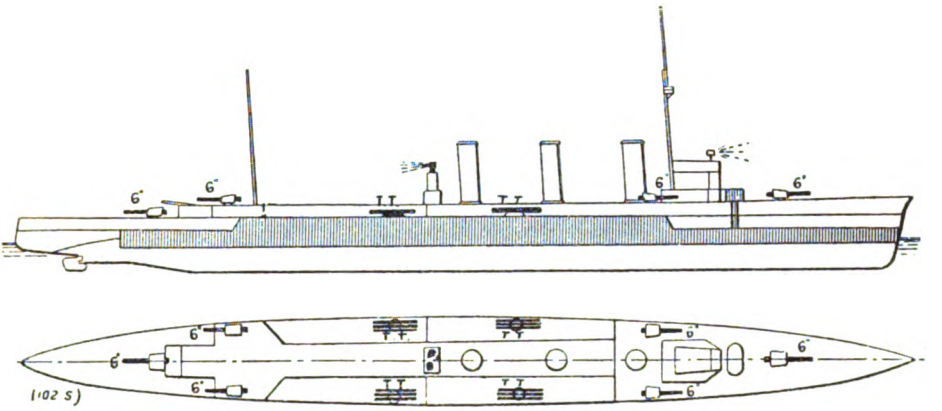
SPAIN.

LIGHT CRUISER.

Mendez Nuñez.

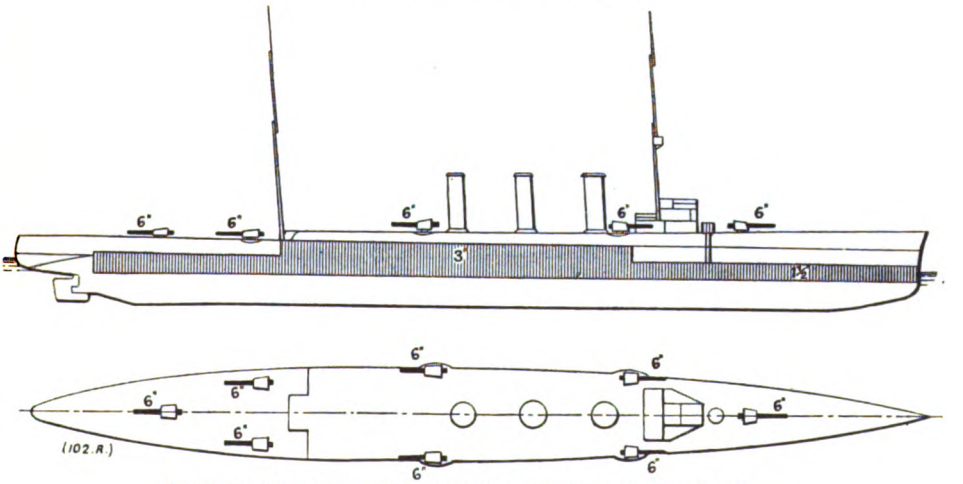


Length (extreme), 462 ft. ; Length B.P., 439 ft. ; 4,509 tons ; Speed, 29 knots. Completed, 1924.
Armament, 6—6-in. ; 4—3-pr. A.A. ; 4 M. ; 4 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to 1½ ins. at the ends.

LIGHT CRUISER.

Republica (*ex*-Reina Victoria Eugenia).



Length (extreme), 462 ft. ; 4,857 tons ; Speed, 25½ knots ; Completed, 1922.
Armament, 9 *—6-in. ; 1—3-in. ; 4—3-pr. A.A. ; 4 M. ; 1 L. ; 4—21-in. torpedo tubes.

* Correction to plan : There should be two 6-in. guns abreast forward instead of one on the centre line as shown.

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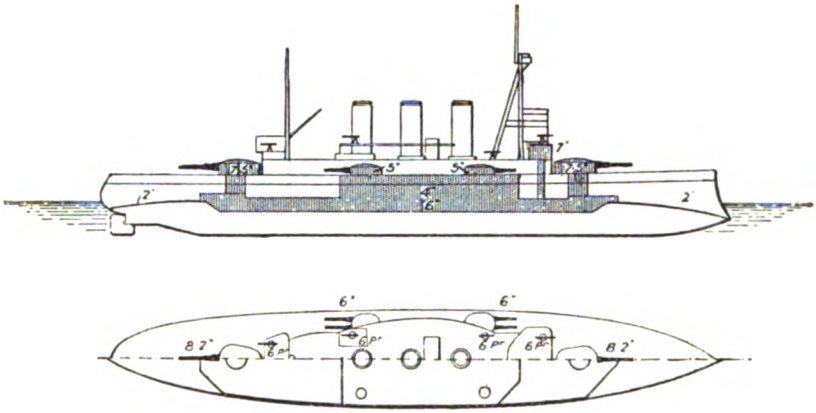
SWEDEN.

BATTLESHIP.

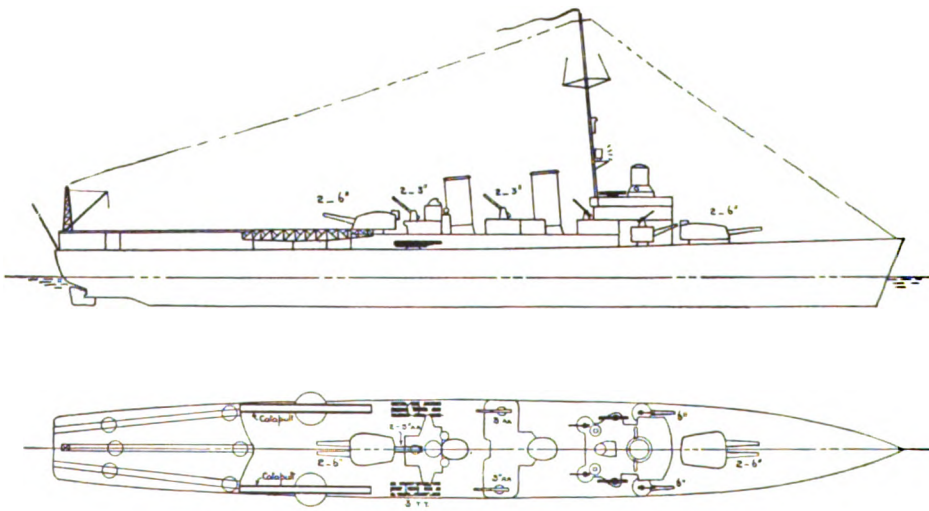
Oscar II.



Length, 313·6 ft. ; 4,085 tons ; Speed, 18 knots ; Completed, 1907.
Armament, 2—8·2-in. ; 8—6-in. ; 8—6-pr. ; 1—1-pr. ; 2 submerged 18-in. torpedo tubes.

AIRCRAFT CRUISER.

Gotland.



Length, 442 ft. ; 4,527 tons ; 33,000 H.P. ; Speed, 27 knots ; Completed, 1934.
Armament, 6—6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes.

Correction to plan : 1 middle line catapult will be fitted instead of two.

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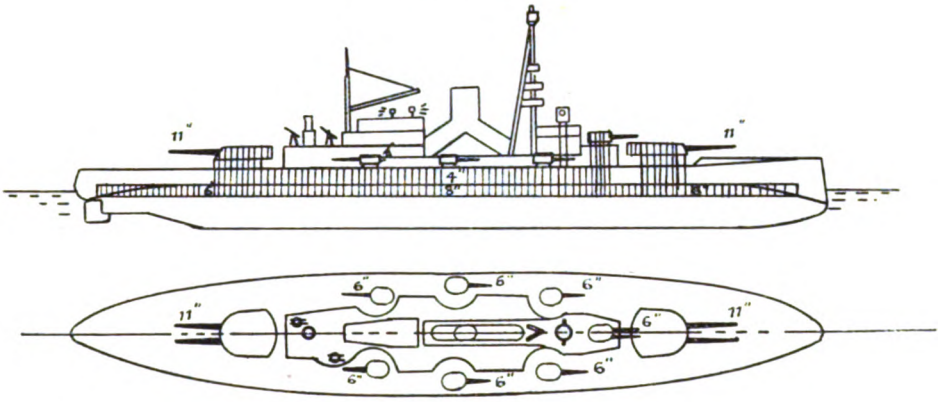
SWEDEN.

COAST DEFENCE SHIPS.

Gustav V. **Sverige.**
(As reconstructed 1924–29.)

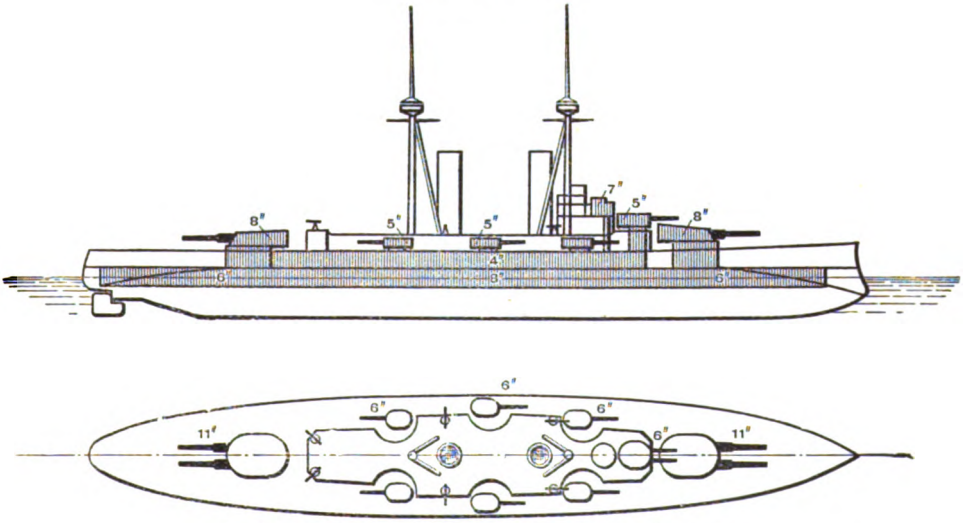


Length, 396·7 ft. ; 6,899 tons ; Speed, 22 knots ; Completed, 1917–1921.
Armament, 4—11-in. ; 8—6-in. ; 6—3-in. ; 2—6-pr. ; 2 M.

SWEDEN.

COAST DEFENCE SHIP.

***Drottning Victoria.**



Length, 396·7 ft.; 6,899 tons ; Speed, 23 knots; Completed, 1921.
Armament, 4—11-in.; 8—6-in. ; 6—3-in.; 2—6-pr. ; 2 M.

* To be reconstructed and modernised as Gustav V and Sverige.

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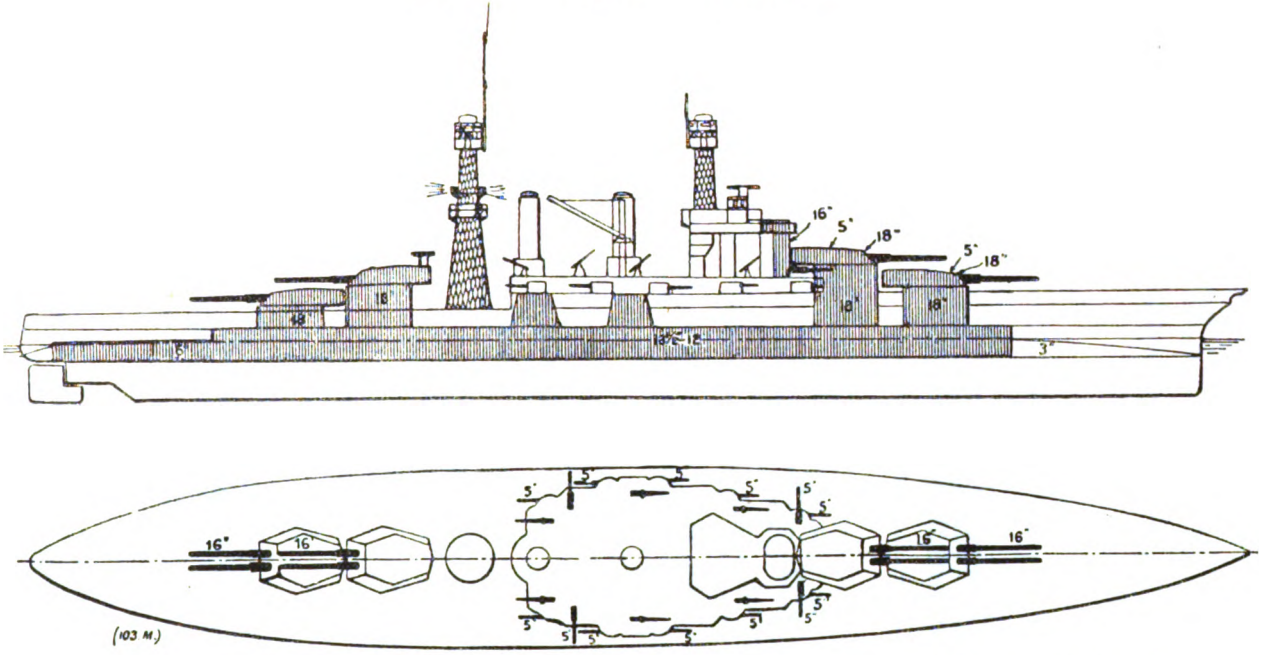
UNITED STATES

BATTLESHIPS.

Colorado. Maryland. West Virginia.



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 32,600 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.

Armament 8—16-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. ; 2 submerged 21-in. torpedo tubes.

Catapult mounted right aft on Quarter Deck ; 3 aircraft.

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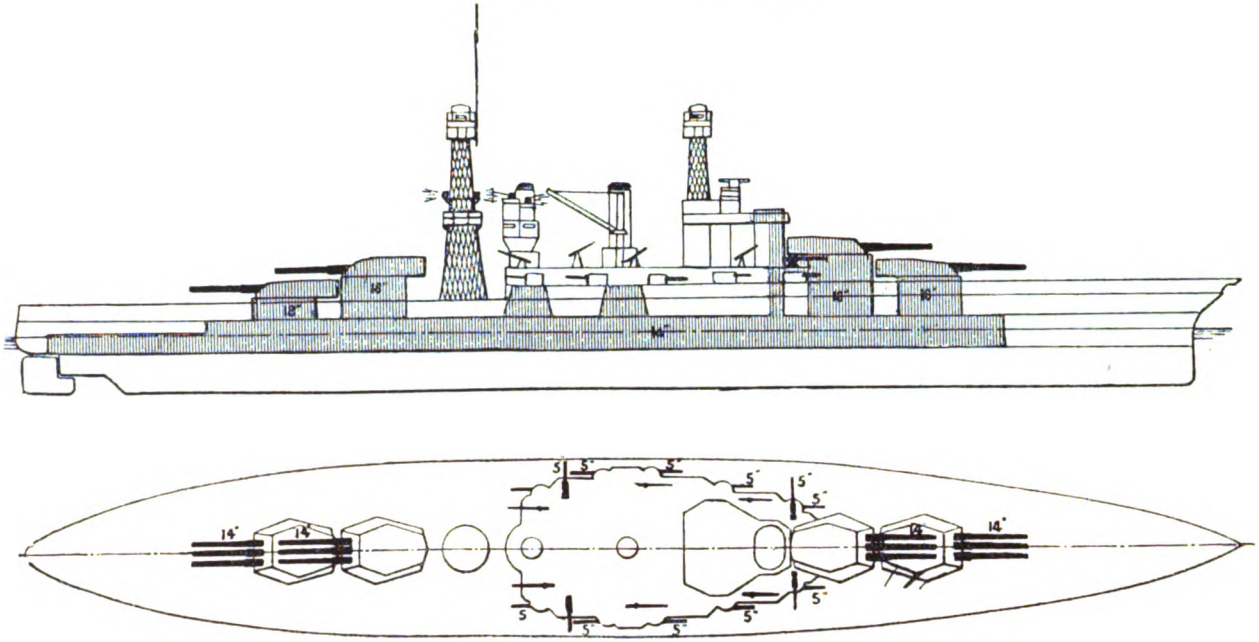
UNITED STATES.

BATTLESHIPS.

California. Tennessee.



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 32,300 tons ; Completed, 1920-21.
Armament, 12—14-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—6-pr. ; 2—1-pr. ; 2 submerged 21-in. torpedo tubes.
2 catapults (one right aft on Quarter Deck and one on the third turret) ; 3 seaplanes.

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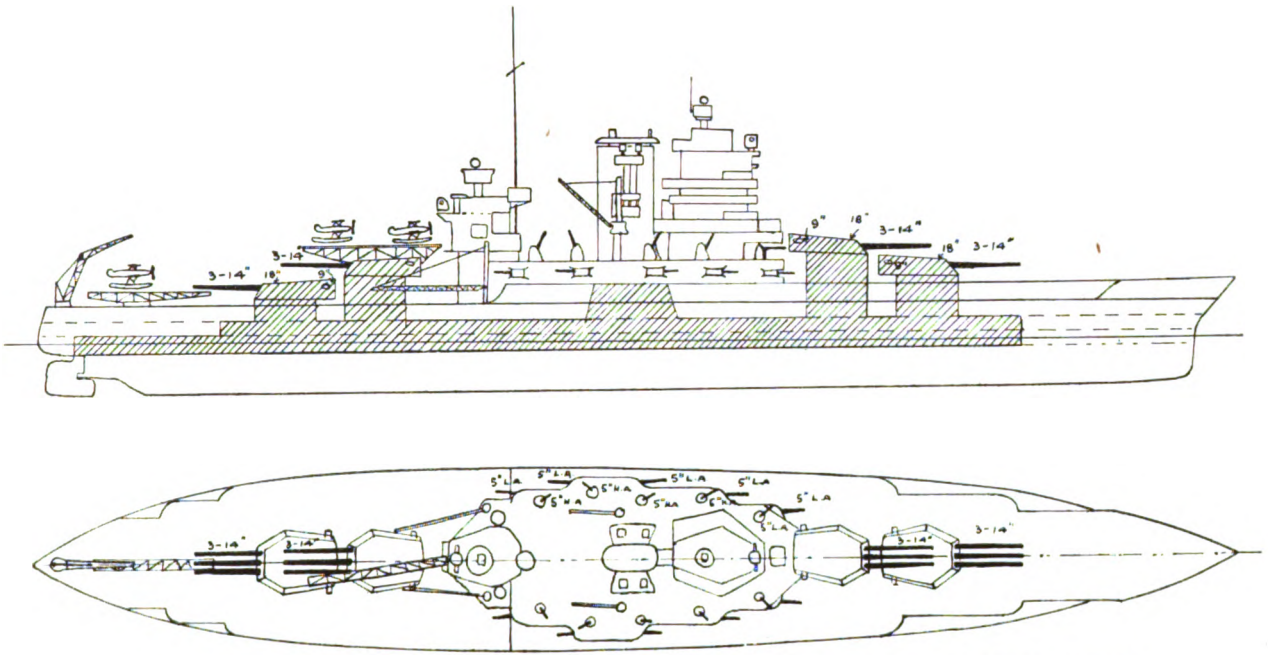
UNITED STATES.

BATTLESHIPS.

Idaho. **New Mexico** **Mississippi**

(After modernisation 1934.)



Length (extreme), 624 ft. ; Length, W.L., 600 ft. ; Speed, 22½ knots ; 33,000 tons : Completed, 1917–1919 ; Modernised, 1931–1934.
Armament, 12—14 in.; 12—5-in. ; 8—5-in. A.A. ; 4—6 pr. (Idaho, 4—3 pr.); 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 seaplanes.

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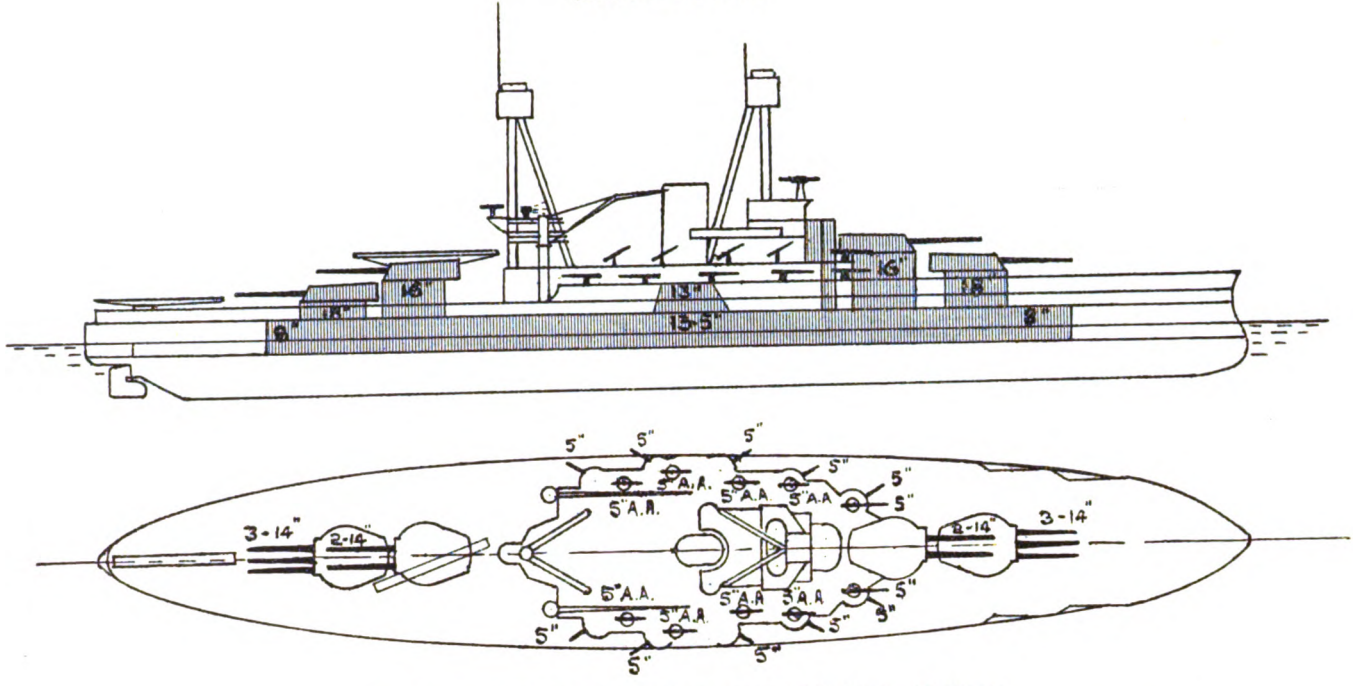
UNITED STATES.

BATTLESHIPS.

Nevada. **Oklahoma.**

(As reconstructed 1929.)



Length (extreme), 583 ft.; Length W.L., 575 ft.; Speed, 20·5 knots; 29,000 tons.

Armament, 10—14-in.; 12—5-in.; 8—5-in. A.A.; 4—6-pr. (Oklahoma, 4—3-pr.); 2—1-pr.; 2 M.; 2 L.; 2 catapults; 3 aeroplanes.

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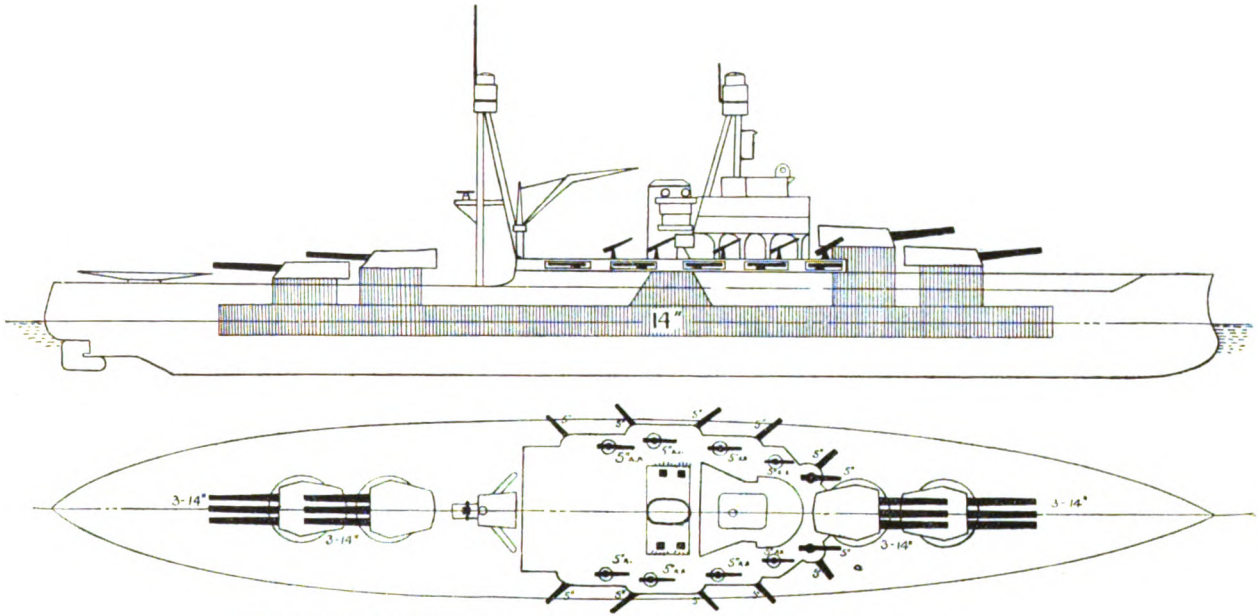
UNITED STATES.

BATTLESHIPS.

Arizona. **Pennsylvania.**

(As reconstructed 1931.)



Length (extreme), 608 ft. ; Length B.P., 596 ft. ; Speed, 21 knots ; 32,100 tons; Completed, 1916.
Armament, 12—14-in. ; 12—5-in. ; 8—5-in. A.A. ; 4—3-pr. ; 2—1-pr. ; 2 M. ; 2 L. 2 catapults ; 3 aircraft.

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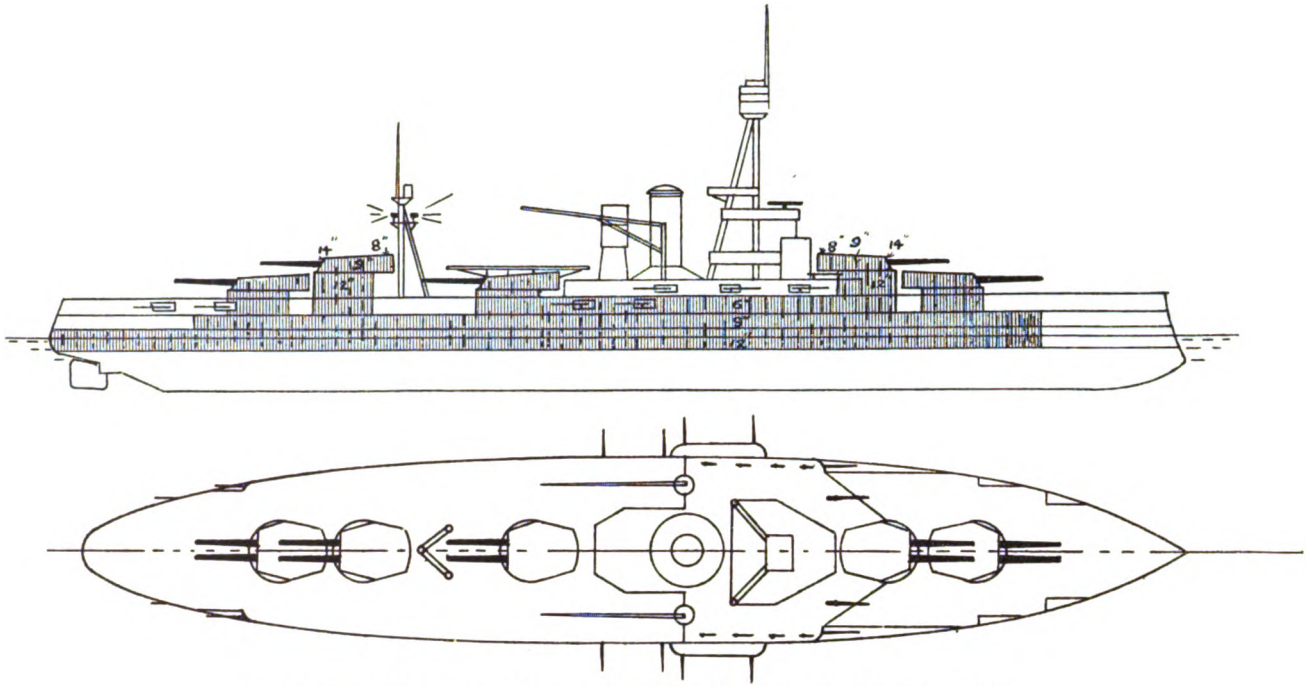
UNITED STATES.

BATTLESHIPS.

New York. **Texas.**

(As reconstructed 1927.)



Length (extreme), 573 ft. ; Length W.L., 565 ft. ; Speed, 21 knots ; 27,000 tons ; Completed, 1914.
Armament, 10—14-in. ; 16—5 in. ; 8—3-in. A.A. ; 4—3-pr. ; 2—1-pr. ; 2 M. ; 1 catapult ; 3 aircraft.

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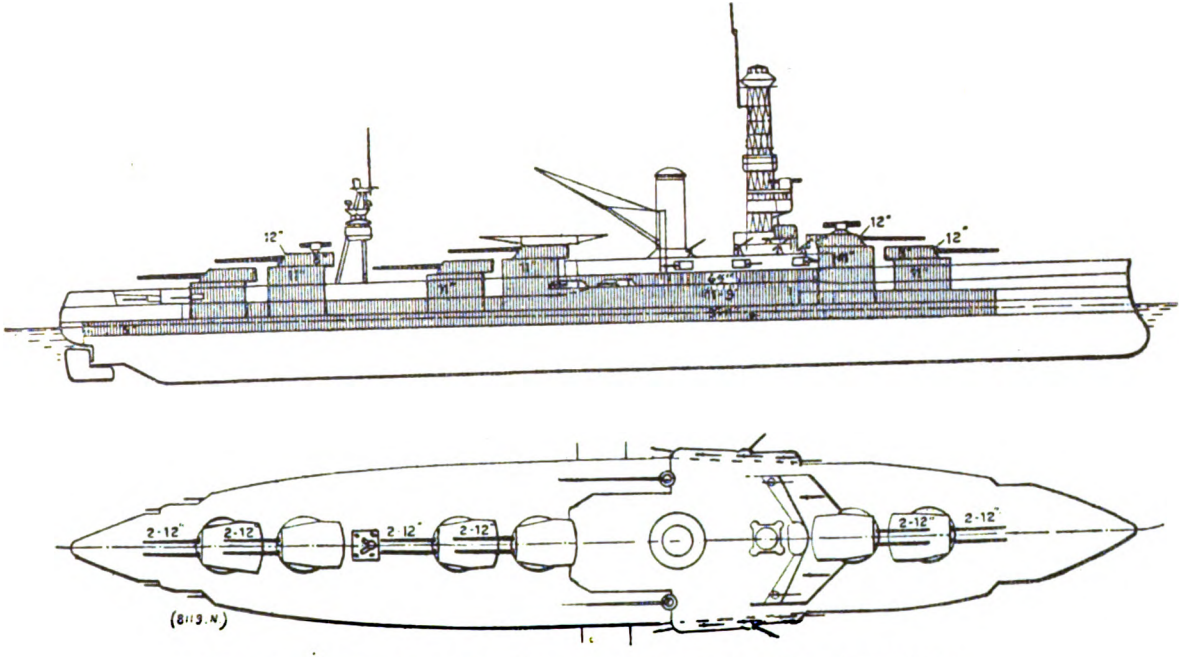
UNITED STATES.

BATTLESHIP.

Arkansas.

(As reconstructed 1927.)



Length (extreme), 562 ft. ; Length, W.L., 554 ft. ; Speed, 20·5 knots ; 26,100 tons ; Completed, 1912.
Armament, 12—12-in. ; 16—5-in. ; 8—3-in. A.A. ; 4—3-pr. ; 2—1-pr. ; 2 M. : 1 catapult ; 3 aircraft.

Wyoming, a sister ship, has been demilitarised and converted to a training ship.

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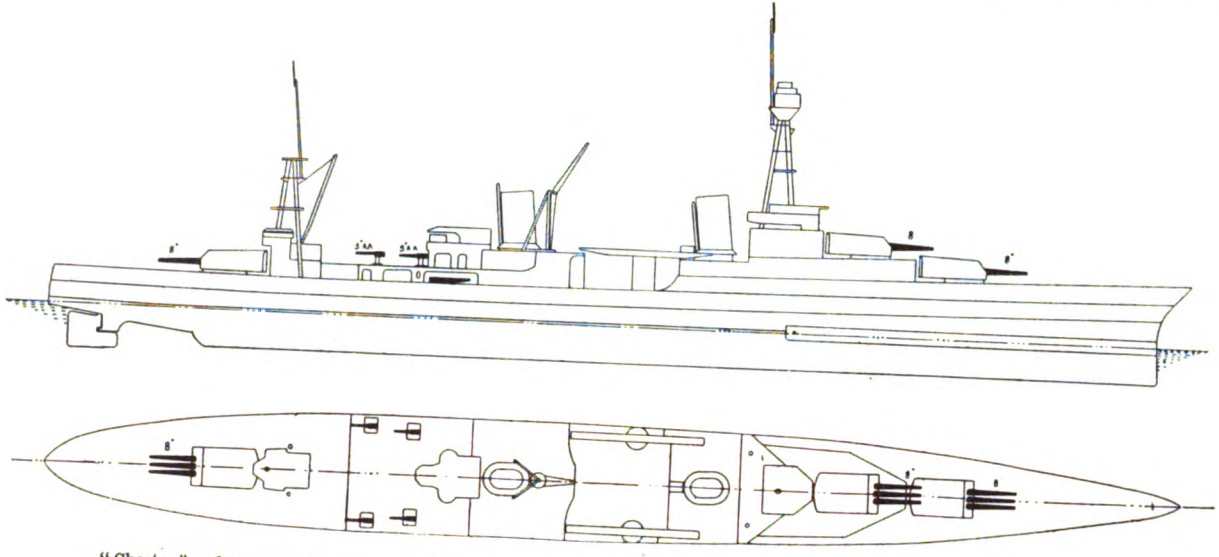
UNITED STATES.

CRUISERS.

Northampton Chester. Louisville. (*"Chester" Class.*) Chicago. Houston. Augusta. (*"Augusta" Class.*)



"Chester" and "Augusta" Classes: Length (extreme), 600 ft.; 9,050–9,300 tons; Speed, 32·5 knots; Completed, 1930–31. Armament, 9—8-in.; 4—5-in. A.A.; 2—3-pr.; 2 triple 21-in. torpedo tubes; 2 catapults; 4–6 seaplanes.

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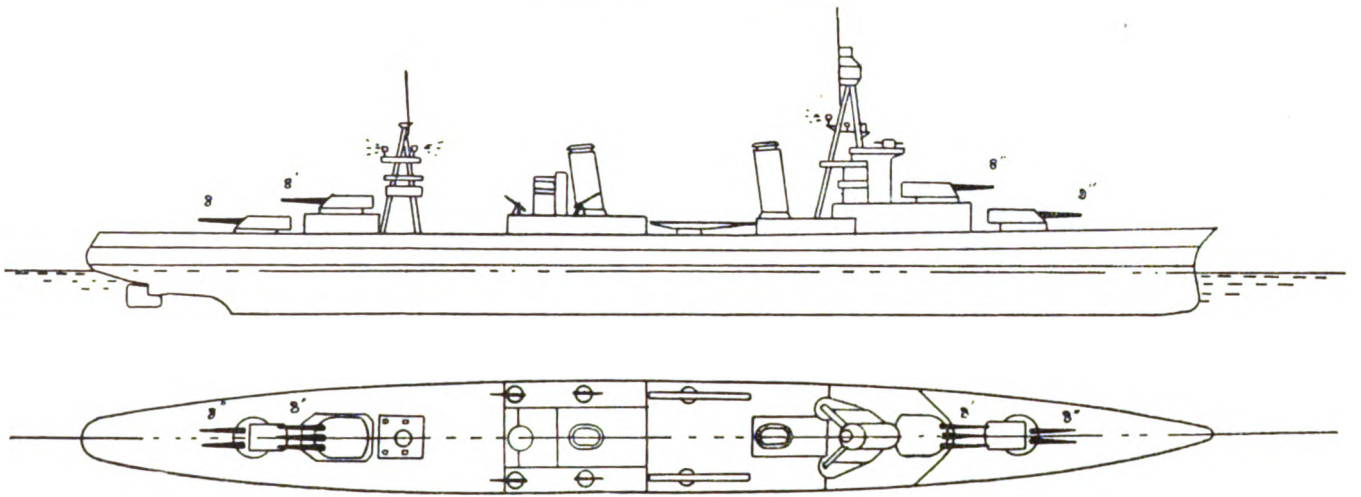
UNITED STATES.

CRUISERS.

"Pensacola" Class.

Salt Lake City. **Pensacola.**



Length (extreme), 585¼ ft. ; 9,100 tons ; Speed, 32¼ knots ; Completed, 1930.
Armament, 10—8-in. ; 4—5-in. A.A. ; 2—3-pr. ; 2 triple 21-in. torpedo tubes.
2 catapults ; 4 seaplanes.

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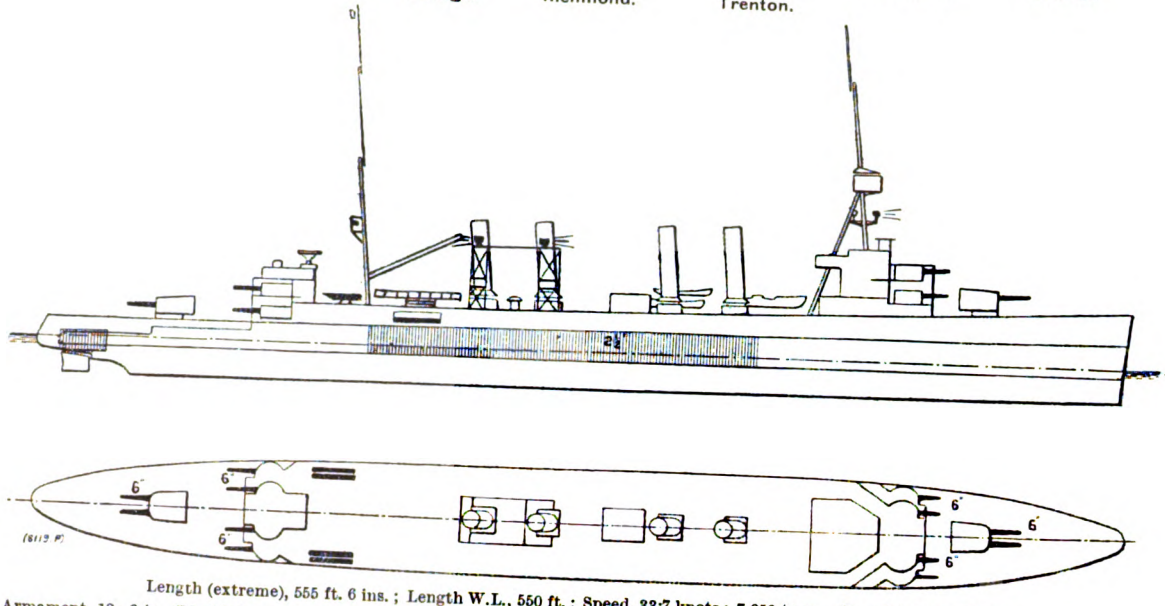
UNITED STATES.

SCOUT CRUISERS.

"Omaha" Class.

Cincinnati. Concord. Detroit. Raleigh. Marblehead. Richmond. Memphis. Trenton. Milwaukee. Omaha.



Length (extreme), 555 ft. 6 ins.; Length W.L., 550 ft.; Speed, 33·7 knots; 7,050 tons. Completed in 1923-25.

Armament, 12—6-in. (Marblehead, 11—6-in.; Cincinnati, Detroit, Raleigh and Richmond, 10—6-in.); 4—3-in. A.A.; 2—3-pr.; 2 triple above-water 21-in. torpedo tubes; 2 catapults; 2 aeroplanes.

Corrections to plan: The pair of single 6-in. guns at upper deck level aft are removed in Marblehead, Cincinnati, Detroit, Raleigh and Richmond. In Marblehead there is a single gun on top of the after battery.

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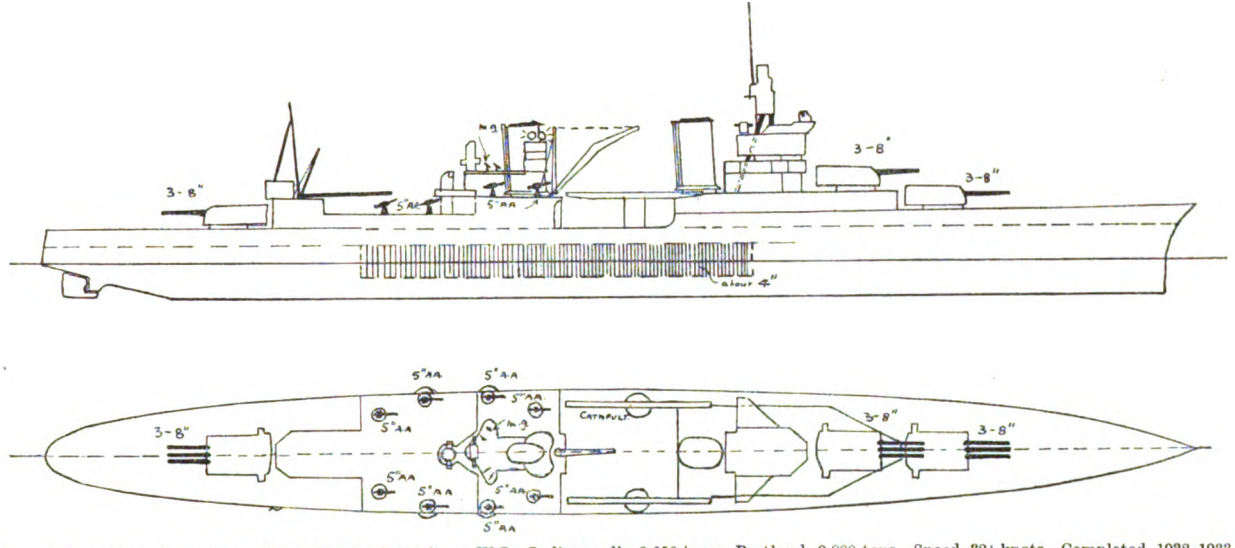
UNITED STATES.

CRUISERS.

Indianapolis. **Portland.**



Length, Indianapolis, 584 ft. on W.L.; Portland, 582 ft. on W.L. Indianapolis, 9,950 tons; Portland, 9,800 tons. Speed, 32¼ knots. Completed, 1932–1933. Armament, 9—8-in., 8—5-in. A.A.; 10 machine guns; 2 catapults; 4–6 aircraft.

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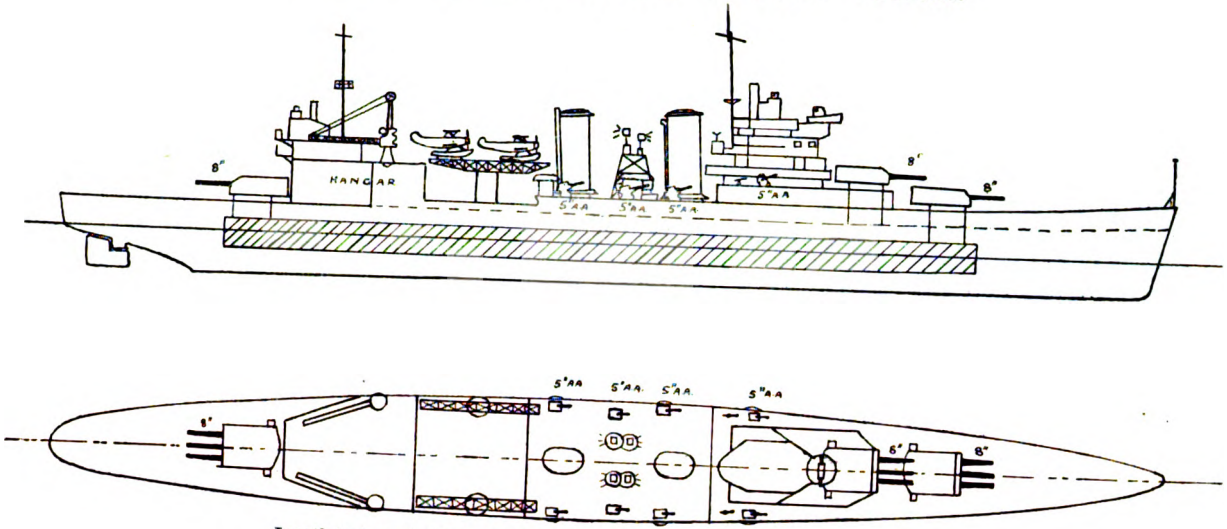
UNITED STATES.

CRUISERS.

"Astoria" Class.

Astoria. New Orleans. San Francisco. Minneapolis. Tuscaloosa.



Length (extreme), 578 ft. 10,000 tons (estd.). Speed, 32¼ knots. Completed, 1934.
Armament, 9—8-in., 8—5-in., 10 smaller; 2 catapults; 4—6 aircraft.

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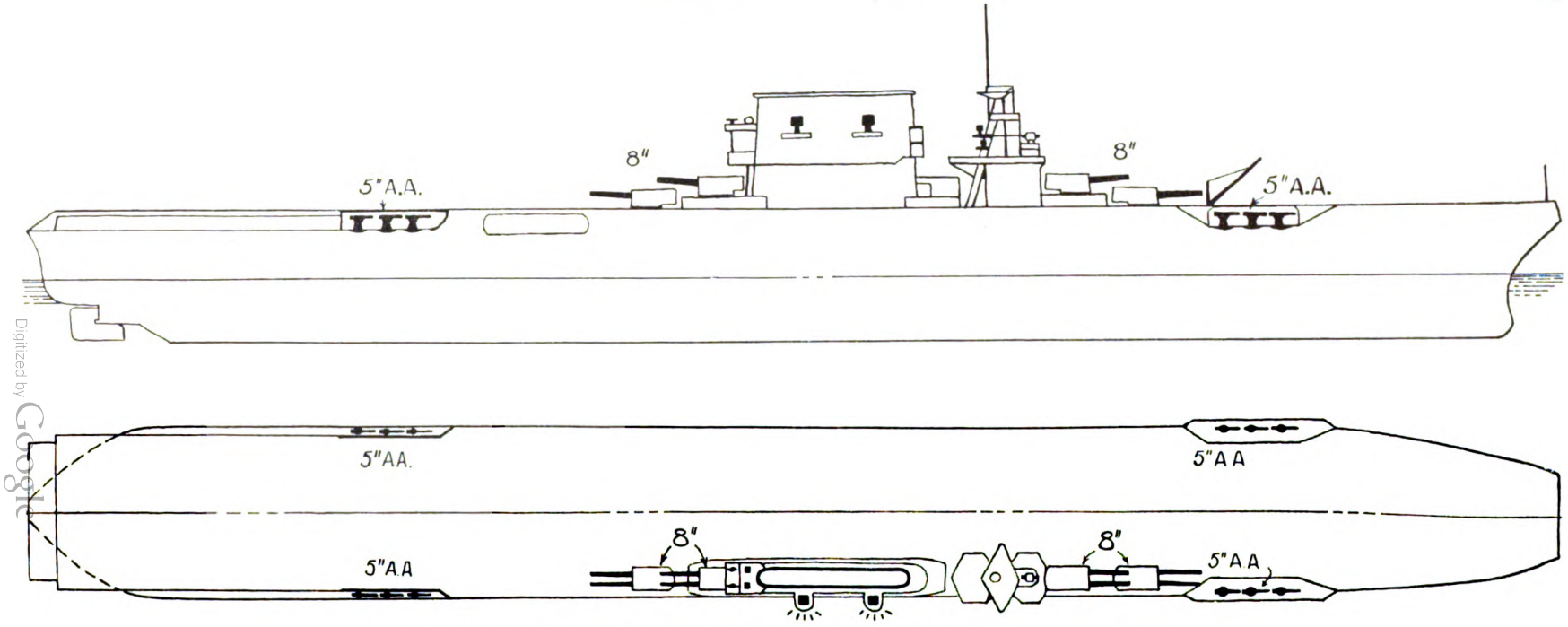
UNITED STATES.

AIRCRAFT CARRIERS.

Lexington. **Saratoga.**



Length (extreme), Lexington, 880 ft. ; Saratoga, 888 ft. ; 33,000 tons ; **Speed, 33¼ knots ;** Completed, 1927.
Armament, 8—8-in. ; 12—5-in. A. A. ; 4—6-pr. : Operate about **80 aircraft.**

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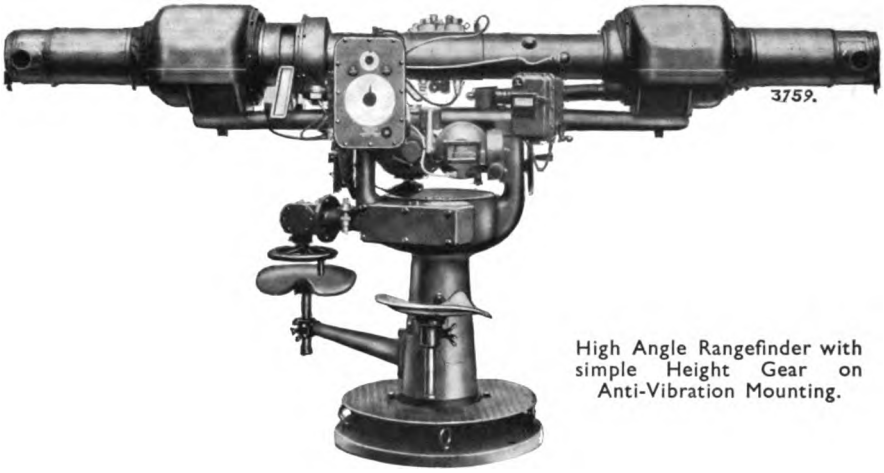

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b. battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *air.c.* aircraft carrier; *air.cr.* = aircraft cruiser; *air.t.* aircraft tender; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser minelayer; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *tr. cr.* training cruiser; *d.* destroyer; *t.b.* torpedo boat; *f.cl.d.* first-class destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship; *sea-p.c.* seaplane carrier; *a.s.* armoured ship; *a.t.* aviation transport; *m.l. & t.s.* minelaying and training ship.

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b. battleship; *b.cr.* battle cruiser; *cr.* cruiser; *a.cr.* armoured cruiser; *a.s.* armoured ships; *a.t.* aviation transport; *air.c.* aircraft carrier; *f.l.* flotilla leader; *l.cr.* light cruiser; *cr.m.l.* cruiser mine layer; *sea-p.c.* seaplane carrier; *s.cr.* scout cruiser; *s.cl.cr.* second-class cruiser; *d.* destroyer; *t.b.d.* torpedo-boat destroyer; *c.d.* coast defence ship; *m.l.&t.s.*=mine layer and training ship; *air. cr.*=aircraft cruiser.

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